# Technology Adoption Among the Students Using Technology Acceptance Model: An Empirical Study on Tripura University

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## Abstract

*The thirst of a learner is unquenchable for learning, acceptance, adopting new methods and approaches. Technology mediation is one method that aspires to provide higher learning gain among pupils. Universities across the globe adopted various modes and methods of the E-learning. However, the perceived ease of use and behavioural constraints has altogether worked as a barrier to technology adoption. This paper attempts to evaluate the perception of the business management students of Tripura University in accepting the digital learning methods through Technology Acceptance Model (TAM). Standard constructs from TAM were tested through a structured instrument and the study indicates the earlier bottleneck resistance has dropped significantly and the peer mentoring is facilitating the teaching- learning processes.*

***Key words:*** *Technology Acceptance Model, E-learning.*

## Introduction

Educational technology or e-learning is learning through electronic means like internet or online, CD-ROM, Memory card run through comport desktop, laptops and Smartphone etc. E-learning has shown a very fast growth and it seems the growth is never ending because of the convenience and effectiveness it provides. Students, academicians and corporate are the prime user of e-learning. In India e-learning market size was USD 16 billion and it is likely to grow at over 5% from 2016-2023 exceeding USD 240 billion. As per Global e-learning market outlook (2015-22) (www.strategymrc.com, 2015) United States leads the e-learning user and Asia is second largest market driven by India and China. India is also getting the boost from the Government's Digital India Initiative. Government of India has launched few schemes like National Mission on Education through information and communication Technology (NMEICT) and National Program on Technology Enhanced Learning.

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Many universities, B-Schools and various other educational institutes in India are adopting the Technology to enhance the learning and teaching experience. Its proving beneficial for both the academicians and students because: of its ease of use, quick paper less sharing, networking, better retention of materials, frequent update of content, convenience and most importantly effectiveness. However a larger section of the students still are affected by stereotype mindsets of the people, low broad band speed, suaveness with use of technology and most importantly more than 75% of the Indian population live in rural areas (as per census 2011) and the reach of internet to those areas are difficult.

## Why Students Resist

Students of tertiary education in India are habitual recipient of chalk and talk teaching method. Whenever a new technology is introduced they tend to reject the idea for want of adequate mentoring and prior knowledge. However, most of the central universities like ours suffer from infrastructural bottleneck and adequate technology supervision which render the adoption process under managed causing the gap of digital divide wide open.

## Discussion on TAM

Acceptance of technology is best explained by TAM (Davis et. al, 1989) and is most widely applied model of user's acceptance and usage of technology (Venkatesh, 2000).Technology acceptance model is an information systems theory that models how users come to accept and use a technology. It is one of the influential extensions of theory of reasoned action (TRA) by Ajzen and Fishbein's. TAM was proposed by Davis (Davis, 1989; Davis Bagozzi, & Warsaw, 1989). TAM based on two factors perceived usefulness and perceived ease of use which predicts attitudes of the user, which consequently influence intentions to the use of technology. This intention then finally impacts the behaviour of actual system use or technology use. It is one of the most widely used models to understand the behaviour and prediction of acceptance and use of new technology.

## Literature Review

Technology acceptance model is applicable in predicting the intention to use internet among the academicians (Kripanont, 2007) An attempt was made (Park, 2009) to analysis of the technology acceptance model in understanding University students' behavioural intention to use e-learning and has confirmed that TAM is useful theoretical model to help in understanding and behavioural usage of e-learning In a similar studies (Cheung ,K., Lee, O., & Chen, Z,2005) reveals that TAM can be employed to predict and understand the students intention to use e-learning and in other to motivate the students to use e-learning. it is important to present positive perception about the technology usefulness.(Adwan,2013) in a study of exploring students acceptance of e-learning using TAM in Jordanian Universities reveals learning technologist and developers ensured regular user engagement and it lead to several useful implications. But e-learning can be improved with the help of blended learning that is face-to-face and use of technology for teaching, students would be more benefitted (Mukherjee, 2014) In another study (Fontanillas, Carbonell and Catasus, 2016) on e-assessment process: giving a voice to online learners reveals continuous evaluation model is highly rated by students as it motivates them keep up with the e-learning process. Experiences of instructors and students feedback on e-learning technologies can help to design for effective virtual courses (Gharib et al., 2016). The students of photography course using e-learning are satisfied (Suksai, 2016). Even the students of Mathematics have shown a positive acceptance towards using e-learning (Borba et al., 2016). Several studies also reveal that instructors play an important role in positive perception and intention to use by the students.

## GAP Analysis

**Table 1: Gap Analysis**

| Author/s | Topic/title | Findings and Gap |
|---|---|---|
| Viswanath Venkatesh, Fred D. Davis | A theoretical extension of the technology acceptance model: four longitudinal field studies | Study was on extension of TAM by Davis (1989). But Learning gain was not considered. |
| Saleh Alharbi, Steve Drew | Using the technology acceptance model in understanding academics' behavioural intention to use learning management system | Study shows the acceptability of TAM in higher-education of Saudi Arabia by the academicians. But the acceptability of students was not done. |
| Sun Joo Yoo, Wenhao David Huang | Can e-learning system enhance culture in the workplace? A comparison among companies in South Korea | The study reveals that a holistic perspective is important to integrate technology in workplace and for sustainability for organization. Learning gain was not measured for students. |
| Nastaran Zanjani, Sykvia L. Edwards, Shaun Nykvist, Shlomo Geva | LMS acceptance: The instructor Role | The study shows that if the instructor does not themselves engage in on-line activities it is difficult to engage students also in on-line activities. But the effectives or learning gain was not measured. |
| Marcelo C. Borba et.al | Blended learning, e-learning and mobile learning in mathematics education | Study reveals the acceptance of e-learning by the students of Mathematics stream. Management students were not considered |
| Debarshi Mukherjee | Role of communication medium in web based instructional environment in Indian Management Education | The study attempts to find the impact of multimedia web based instructional system as mode of communication among management students. But Learning gain was not directly measured. |
| T.Ramayah et al. | Technology acceptance model: it it applicable to users and non-users of internet banking | Technology acceptance model is more accepted to predict the intention to use by the current user rather than on-user of internet banking. The prediction and gain of learning by students was not attempted. |

## Objectives

The extensive literature review revealed few important research gaps that helped to set the objectives of the study which are,

1. To study the impact of e-learning tools on students' learning gain.
2. To study the satisfaction level of students using the e-learning technologies.
3. To study the behaviour of students towards e-learning technologies.
4. To study the usefulness of e-learning technologies on student's learning gain.

## Proposed Research Model

According to Davis (1989) and Venkatesh (1996) Technology Acceptance Model (TAM) has been used widely in research that looks for acceptance of new technologies. For the purpose of research we have used TAM without the external variables and how perceived usefulness, perceived ease of use, attitude towards use and behavioural intention to use leads to action of use which results in learning gain. Learning gain can be defined as an attempt to measure the improvement in knowledge, skills, articulation and personal development made by students during their time spent in higher

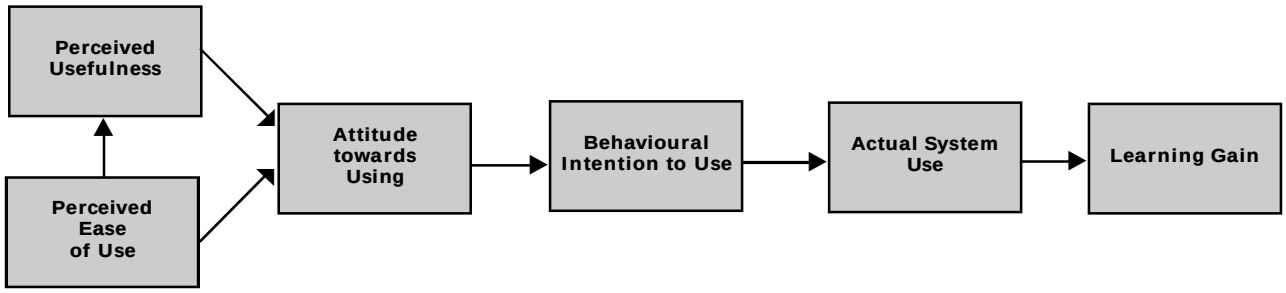



**Figure 1: Proposed Research Model (Original TAM model adapted from Davis, 1989)**

education. The proposed research model is shown in figure1.

## Hypotheses Development

From the above research model the following hypotheses have been development,

H1. There is a significant positive relationship between students' perceived ease of use and use of e-learning tools.

H2. There is a significant positive relationship between students' ease of use of e-learning technologies and attitude towards using.

H3. There is a significant positive relationship between perceived usefulness and attitude towards using e-learning

H4. There is a significant positive relationship between attitude towards using e-learning and behavioural intention to use.

H6. There is a significant positive relationship behavioural intention to use and actual system use.

H7. There is a significant positive relationship between actual system use and learning gain.

## Research Methodology

The study has been conducted with the help of a structured questionnaire which was administered to 40 respondents who are the students of business management programme, Tripura University. Out of which one was rejected, total 39 is actual sample taken into consideration.

Multiple regressions was used for analysis using SPSS ver.16

## Analysis

Data were tested using SPSS ver.16

**Reliability Statistics**

| Cronbach's Alpha | N of Items |
|---|---|
| .870 | 5 |

The first table is reliability statistics table that assess the reliability, or internal consistency, of a set of scale or instrument used.

Cronbach's Alpha test shows alpha is 0.870 which can be called as reliable as it alpha p<.5 is considered good to run the next series of tests.

## Regression

To measure the impact of the independent variables viz. PU (perceived usefulness), PEOU (perceived ease of use), ATU (Attitude toward use) and BI (behavioural intention to use) on the dependent variable viz. LG (learning gain) multiple regression was used. The above variables were extracted from the proposed research model.

Based on our model the regression equation stands as:

**Model is Significant**

**Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| LG | 2.378 | .891 | 39 |
| PU | 2.243 | .793 | 39 |
| PEOU | 2.044 | .747 | 39 |
| ATU | 2.198 | .786 | 39 |
| BI | 2.628 | 1.162 | 39 |

LG=B1PU + B2PEOU + B3ATU + B4BI+ B0

Regression result:

Descriptive table 1. Mean of Learning gain( LG), Perceived usefulness (PU), Perceived ease of use (PEOU), Attitude towards use (ATU), and

**Correlations**

| | | LG | PU | PEOU | ATU | BI |
|---|---|---|---|---|---|---|
| Pearson Correlation | LG | 1.000 | .675 | .679 | .626 | .699 |
| | PU | .675 | 1.000 | .658 | .458 | .498 |
| | PEOU | .679 | .658 | 1.000 | .633 | .495 |
| | ATU | .626 | .458 | .633 | 1.000 | .547 |
| | BI | .699 | .498 | .495 | .547 | 1.000 |

Behaviuorial Intention to use (BI) are almost same. The table is reflecting the significance of mean.

The above table shows that learning gain is moderately correlated with Perceived usefulness, perceived ease of use, attitude towards use and behavioural intention to use

**Variables Entered/Removed[b]**

| Model | Variables Entered | Variables Removed | Method |
|---|---|---|---|
| 1 | BI, PEOU, PU, ATU[a] | . | Enter |

a. All requested variables entered.

b. Dependent Variable: LG

**Model Summary[b]**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics | | | | | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
| 1 | .831[a] | .690 | .654 | .525 | .690 | 18.935 | 4 | 34 | .000 | 1.960 |

a. Predictors: (Constant), BI, PEOU, PU, ATU

b. Dependent Variable: LG

as p<0.5. Hence we can say that the equation fits in the model.

The above table shows the multiple regression model summary and overall fit statistics. We find that adjusted R Square of our model is 0.654 that means the regression explains 60.54 % of the variance in the data. The Durbin-Watson d =1.960, which is between 1.5 < d< 2.5 and therefore there is no first order linear auto-correlation in our multiple linear regression data.

**ANOVA[b]**

| Model | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 20.867 | 4 | 5.217 | 18.935 | .000[a] |
| | Residual | 9.367 | 34 | .276 | | |
| | Total | 30.234 | 38 | | | |

a. Predictors: (Constant), BI, PEOU, PU, ATU

b. Dependent Variable: LG

The above table is the F-test, the linear regression's F-Test has the null hypothesis that there is no linear relationship between the variable. The F-test is highly significant, thus we can assume the there is a linear relationship between the variables in our model.

| Model | Unstandardized Coefficients | | | Standardized Coefficients | t | Sig. |
|---|---|---|---|---|---|---|
| | B | Std. Error | Beta | | | |
| 1 | (Constant) | .013 | .295 | | .043 | .966 |
| | PU | .313 | .148 | .279 | 2.121 | .041 |
| | PEOU | .251 | .174 | .211 | 1.441 | .159 |
| | ATU | .187 | .149 | .165 | 1.254 | .218 |
| | BI | .281 | .093 | .366 | 3.018 | .005 |

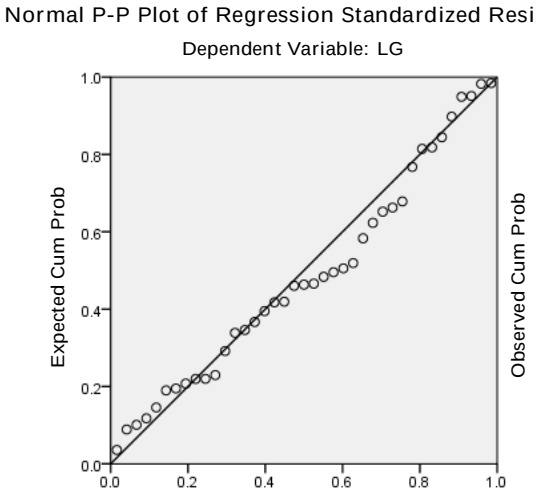
a. Dependent Variable: LG=

So the above table helps in formulating the final regression equation LG = 0.313 PU + 0.251 PEOU + 0.187ATU + 0.281BI + 0.013 Hence the above table shows that Learning gain is more dependent by Perceived usefulness and behavioural intention as the significance point

**Residuals Statistics[a]**

| | Minimum | Maximum | Mean | Std. Deviation | N |
|---|---|---|---|---|---|
| Predicted Value | 1.04 | 4.7984 | 2.3782 | .74103 | 39 |
| Residual | -.94 | 1.12772 | .00000 | .49649 | 39 |
| Std. Predicted Value | -1.79 | 3.266 | .000 | 1.000 | 39 |
| Std. Residual | -1.79 | 2.149 | .000 | .946 | 39 |

a. Dependent Variable: LG




**Charts**

0.41 and 0.05 respectively. The other variables perceived ease of use and attitude towards use is least significant which leads to ultimate Learning gain.

This table also checks for multicollinearity in our multiple linear regression model. The plot indicates that in our multiple linear regressions analysis there is no tendency in the error terms.

## Conclusion

Various studies has been done using technology acceptance model to check the acceptance of technology tools at various educational institutions and organizations. Similar attempts has been made in this study with a specific objective to measure its impact over learning gain which indicates perceived usefulness of e-learning tools and behavioural intention to use e-learning to use influences learning gain significantly whereas the impact of perceived ease of use and attitude towards use of e-learning is limited over the dependent variable. Hence, it shows that students are benefited by the use of e-learning. Even with conditions where power cuts are very frequent, and low broad band internet connectivity students are motivated to use the technology tools which will enhance their skills. Further studies can be done to check the significance of other variable like perceived ease of use and attitude towards use. The study was concentrated only on one university, hence further studies can be done in education sector like secondary, higher secondary and tertiary education sector, which will widen the area and will also give a better glimpse of use of e-learning and its actual results.

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