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Technology Acceptance Model and AI based Educational tools

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Abstract

The technology acceptance model describes how people accept and make use of technology. TAM was developed by Fred Davis in 1986 and is based on the idea that our attitudes towards technology are shaped by two key factors: perceived usefulness and perceived ease of use. The present research paper investigates the TAM (Technology Acceptance Model) for AI based learning and educational activities used by students in their daily lives. Students now-a-days make use of a large number of AI based educational tools such as ChatGPT, Grammarly, QuillBot etc. These AI based learning tools have become a new trend in the educational era today.The objectives of the research paper are firstly to study the awareness and acceptance level of students towards Artificial Intelligence and secondly to identify the corelation between ease of use and usefulness towards adoption of AI learning tools. The research paper is based on both secondary and primary data.

Keyword: Artificial Intelligence, Technology Acceptance Model, TAM, Educational tools.

INTRODUCTION

The world today is using computers and technology to work as human brain. People are making use of advanced technology in their daily lives. The data which is being generated through machines is not idle. This data has become a major source of decision making in organizations and has given a new reform in science and technological era. Artificial Intelligence is not a new term for anyone now-a-days. It is growing at a rapid rate with dynamic advancements in the society in terms of machines, conceptual thinking, data management, data analysis etc. Every organization, be it small or big, individuals, groups are using tools of Artificial Intelligence to ease their work and to progress in their area. According to Britannica the term Artificial Intelligence, popularly abbreviated as AI, is considered as "the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings." Some important elements of AI are Machine Learning and Language Processing. Machine learning makes use of defined algorithms used on data sets which helps to study patterns and perform activities like categorizing the data, data analysis and future predictions. Language Processing ensures that Artificial Intelligence makes use of the language that people understand be it written or spoken.

Various sectors of the society such as Agriculture, Robotics, Gaming, Entertainment, Finance, Social Media etc, are impacted by the role of AI and its tools and Education is one of the sectors that is largely affected by the AI tools. AI based learning and educational activities are used by students and teachers in their daily lives. AI is transforming the way of teaching and learning. With digital information coming up, concept visualizations, task assessments etc, the educational sector is transforming rapidly with adoption of these tools. The

present research aims to find out the technology adoption regarding AI among student groups. The objectives of the research paper are:

1. To study the awareness and acceptance level of students towards Artificial Intelligence tools used in educational learning and
2. To identify the inter-relationship between ease of use and usefulness towards adoption of AI learning tools.

The present research uses the Technology Adoption Model (TAM) (Figure No 01) which explains how to encourage users to accept and use new technology. It is based on the fact that people's perception regarding usefulness of a technology and its ease of use affects their attitude and intention to use it.

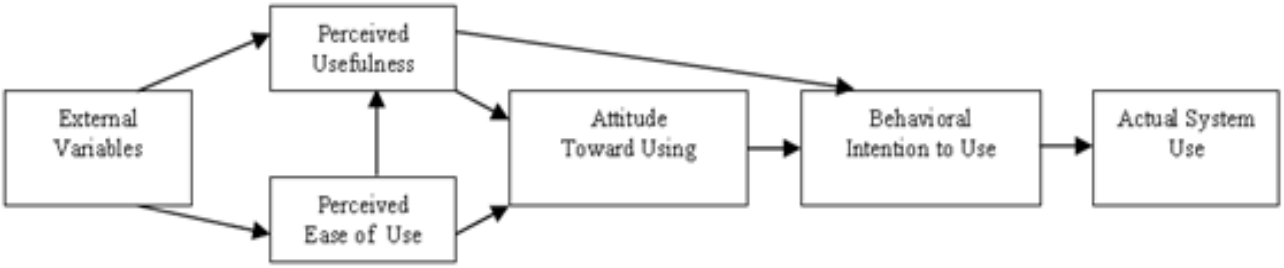

Figure 1: Technology Acceptance Model (Davis 1989)

REVIEW OF LITERATURE

Saini (2023) discussed about the concept of artificial Intelligence, introduction, definitions of AI, history, applications, growth and achievements highlighting the role of machine learning and natural language processing etc.

Verma (2018) mentioned about Artificial Intelligence technology and its scope in different areas with special reference to the use of this technology in the field of education along with its meaning, searching techniques, inventions and future. Grading, student's educational needs, places of course improvement, helpful feedback, change how schools find, teach, and support students etc are the major benefits of AI discussed in the research paper.

Shabbir and Anwer (2015) discussed about the applicability of AI in today's scenario, the reasons why AI cannot match human intelligence and the problems of AI to reach and outperform human level of intelligence.

RESEARCH METHODOLOGY

The present study is a pilot study conducted on 40 respondents. The respondents were basically students who have been using the AI based educational tools in their daily life. The sample for the pilot study was collected through convenience sampling method. The data was collected through a questionnaire that measured the following variables: PEOU, PU, BI and ATT The results of the pilot study will be used for the main study.

RELIABILITY

Reliability Analysis was conducted for validity. Table No 1 shows the Cronbach's Alpha value is .778 which is an acceptable value for the research.

Table 1

Reliability Statistics

Cronbach's Alpha	N of Items
.778	14

DATA ANALYSIS

As shown in Table no 02, it was found in the pilot study that 57.5% respondents were in the age group of 20-25 years and42.5% of the respondents age group was 15-20 years. 55% were male and 45% were female. 90% of the respondents were pursuing graduation and 10% respondents were pursuing post graduation.

Table 2 Demographic Profile of the respondents

Age	Categories	Frequency	Percentage (%)
	15-20 yrs	17	42.5
	20-25 yrs	23	57.5
Gender			
	Male	22	55
	Female	18	45
Education			
	Graduate	36	90
	Postgraduate	4	10

CORRELATION ANALYSIS

A Pearson Correlation analysis was done. The results revealed a moderate relationship and statistically significant correlation between the variables as shown in Table No 03. This indicates that PEOU tends to affect PU to a moderate level.

Table 3 Correlations

		PEOU	PU
PEOU	Pearson Correlation	1	.502**
	Sig. (2-tailed)		.001
	N	40	40
PU	Pearson Correlation	.502**	1
	Sig. (2-tailed)	.001	
	N	40	40

**. Correlation is significant at the 0.01 level (2-tailed).

PEOU is the Independent Variable and PU is the dependent variable. Regression analysis was performed. R-Square value was .252 which indicates that 25.2% of the variance can be predicted from PEOU. (Table No 04).

Table 4 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.502[a]	.252	.232	1.85506

a. Predictors: (Constant), PEOU

Table 5

	Beta value	t-value	R-square
PEOU	.233	1.01	.26
PU	.215	1.17	.35

Regression between PEOU and PU on ATT is shown in Table No 05. The results showed the R square value to be 26% and 35% variation in Attitude due to PEOU and PU.

Table 6 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.698[a]	.487	.443	2.05061

a. Predictors: (Constant), ATT, PEOU, PU

Regression analysis was done between PEOU, PU and Attitude on Behavioural Intention. As shown in Table No 06, a variance of 48.7% can be seen in the Behavioural Intention through Attitude, PEOU and PU.

CONCLUSION

Overall TAM was partially supported in the pilot study on the basis of the data collected from 40 respondents. The results of the pilot study will be further analyzed and the results will be combined with the main study. The overall results showed that the Technology acceptance model was applicable to the AI based educational tools but to a moderate level. In order to find a more stronger correlation between the factors studied, the present pilot study will be extended to a main study with an increased number of sample size. The results of the main study will help to finally conclude about the application of the Technology Acceptance Model towards the AI based educational tools.

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