Research Article

The Adoption of Digital Smart Board in Delhi Government Schools: A Student's Perspective

Pawan Kumar Sharma[1] & Enid Masih[2]

[1]Research Scholar, Sam Higginbottom University, Allahabad

Email: paw_kum@yahoo.com

[2]Associate Professor, Sam Higginbottom University, Allahabad

Abstract

Schools in India have been equipped with Digital Smart Board to enhance learning in classrooms. The classical learning process has undergone some fundamental behavioural modifications because of the increased focus on digital learning. The essence of this study is to examine the acceptance of the Digital Smart Board by students in the classroom. The Technology Acceptance Model (TAM) is utilised in the study to explain students' behaviour towards smart boards in Delhi government schools. A sample of 184 students enrolled in government schools is examined to collect information for smart classrooms using a five-point Likert scale questionnaire. The findings show that the intention to use has a direct relationship with the perceived value of the digital smart boards and their usability, which results in an increased desire to adopt Digital Smart Boards. The outcome indicates that digital education has the potential to modernise education practices in Delhi Government schools.

Keywords: TAM, Smart classrooms, Intention to use, Digital smart boards

Introduction

Literacy has emerged as the most crucial learning goal in modern society. Many people struggle to embrace the idea that the majority of what we do now is technology-aided, especially in digital literacy. Computers have a remarkable impact, notably in education, on improving learning.

The current growth of smart classes could increase the overall knowledge of students. By adopting technology, today's students have attempted to increase their classroom interaction through "smart learning". The use of Information Technology (IT) to assist interaction and learning in classrooms has increased (Martin,ll and F.w.Kellermanns, 2004. Digital tools have a positive impact on the teaching and learning process by creating opportunities to create, share, and collaborate with students.

The connections between students and teachers in traditional classroom settings have become quite constrained. That is why we are embracing technology to improve learning outcomes. With the growth of technology, the education sector is undergoing reformation like never before. The digital tools and content in the native language from different sources have been made available in K-12 Schools.

This study emphasises the effectiveness of one of the technology tools i.e., Digital Smart Board used in Delhi government schools. A huge integrated display with a whiteboard-like form factor is known as a Digital Smart Board (DSB). It is also referred to as Interactive Display Board. A computer that's fast to install and interactive to learn is provided in Delhi government schools. It can convert any

plain white surface into a learnable board for different stages of blended learning needs. It includes pre-loaded, powerful interactive content in line with students' syllabuses and a supportive setting for delivering courses to meet all learning requirements.

Digital Smart Boards have transformed the way the curriculum is styled and delivered. Software is combined with display screen technologies to provide engaging and interactive lessons. The smart boards offer countless options for presenting effective lessons, learning content for Grades 6-12 and assessments as per the NCERT syllabus.

It can connect to the internet for further knowledge and content updates. The plug-and-use gadget is movable across classes and can be set up without the need for a desktop, projector, or other established infrastructure.

TAM [Davis, FD, 1989], is the focus of a current study that seeks to find out the acceptance of the Digital Smart Board among students for learning. It is the most used conceptual model for describing and forecasting information technology adoption behaviour. TAM is well-known and has more than 700 citations in the literature and has strong theoretical and empirical support.

Figure-1: The Principal scheme of the original TAM
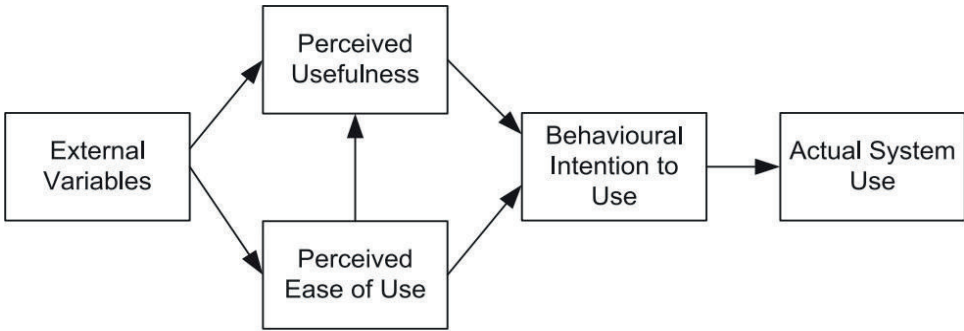
According to Davis. et al. (1989), the factors are described as follows:

1. The term "perceived usefulness" refers to how much a person believes a given technology would improve his or her job performance.

2. The degree to which a person thinks utilising a specific system would be effortless is known as "perceived ease of use".

3. The behaviour Intention refers to the likelihood that an individual intends to use technology or an Information System.

The purpose of this paper was to evaluate the acceptance of the Digital Smart Board and provide feedback to decision-makers that this technology is a justifiable investment for the Delhi government.

Review of Literature

Education authorities across the globe are adopting technology tools to improve students' learning in the classroom and develop skills for the 21st century global workforce. Extensive research and case study observations from the United Kingdom, USA, and Australia prove that Digital Smart Boards or Interactive Whiteboards increase student engagement and motivation.

Janelle Cox (2019), Technology in Classroom, TeachingHub.com has

emphasised the various advantages of having a Digital Smart Board in the classroom. It enhances the student learning experience as pre-loaded multimedia content can be displayed on a large screen in the classroom. The interactivity feature helps students draw and write directly on the screens using their figures or digital pens. Teachers can use videos, diagrams, and charts on Digital Smart Board to increase student engagement.

According to Ferrari (2012), it is crucial to integrate digital technologies into educational processes because they are advantageous for both teaching and learning and help people develop the fundamental digital skills that are essential for success in modern society.

Abdulsalam Salihu Mustafa, Manuel B. Garcia (2021), TAM is a widely used theory for analysing how consumers react to different kinds of information systems. To understand consumers' intentions to accept online learning, several information systems theories have been incorporated into TAM over time. The Task Technology Fit and Theory of Planned Behaviour are the most integrated and educationally successful theories in TAM, according to the systematic review's conclusions.

The various other pieces of literature reviewed for this paper are:

1. Lee et al., Analysis of TAM's history and prediction of its future trajectory Progress and discoveries of TAM in the period from 1986–2003; identification of future directions.

2. The Horizon Report (Johnson, Adams Becker, Estrada, & Freeman, 2015) underscores that learning must examine educational scenarios, making them more flexible and adapting them to digital technologies.

3. Turner et al., Analysis of TAM in the context of technology usage prediction TAM usage outside the context in which it has been validated requires thoughtful consideration.

Objective of Study

The objective of this study is to understand the acceptance of technology i.e. Digital Smart Board by the students of Delhi Government Schools. The proposed model has three primary constructs. Figure 2 represents the proposed model for acceptance.

The following hypotheses are made based on the relationship between the "intention to use, perceived usefulness, and perceived ease of use" of a digital smart board:

H1: An increase in the perceived usefulness will positively influence the usage of the digital Smart Board.

H2: An increase in the perceived ease of use will positively influence the usage of the digital Smart Board.

H3: There exists a positive relationship between perceived ease of use and users perceived usefulness.

Figure-2: Conceptual Framework
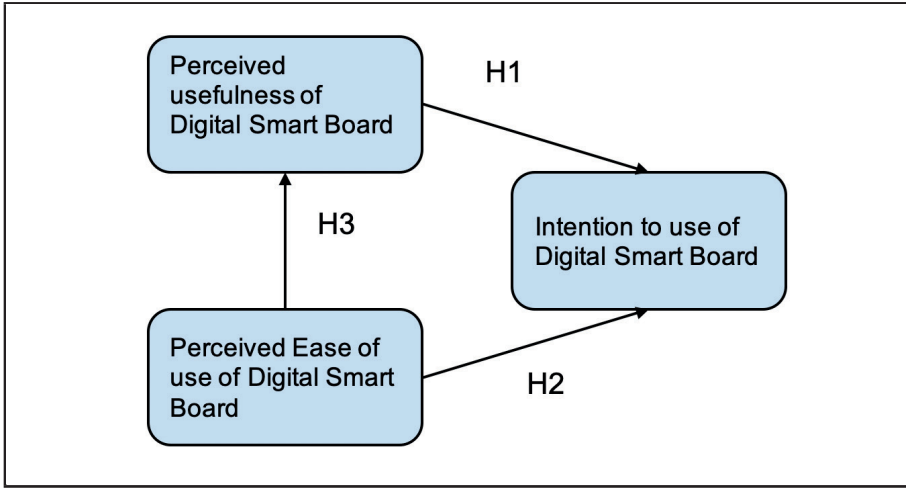
Methodology

A quantitative method is used to measure the factors and establish relationships. The population researched in this study consists of learners in government schools under the Directorate of Education, Delhi

- **Sample Description**

S. No	Item	Description
1	Population	Respondents, i.e., students from various government schools from Grade 6-12
2.	Technique	Simple Random Sample: In this technique, each element in the population has an equal chance of being selected from the sample
3.	Size	Total responses: 184 Valid responses: 158

- **Data Collection Instrument**

We carried out a self-administered survey to evaluate the hypotheses of the suggested model. For the survey, a single cross-sectional design has been used, as per annexure 1. The questionnaire has been divided into three parts; each part corresponds to one construct.

1. Four questions to measure the perceived usefulness of a Digital Smart Board

2. Four questions to measure the perceived ease of use of the Digital Smart Board

3. Three questions to measure the intention of using a Digital Smart Board

A thorough analysis of relevant literature had taken place to create the final questionnaire. The questionnaire includes questions to gauge each indicator's effect. The 5-point Likert scale, which is supported by Berdie (Berdie, DR, 1954), has been used as a

measurement technique in his study. All items use a scale ranging from 1-*Strongly Disagree*, 2-*Disagree*, 3-*Neither Agree nor Disagree*, 4-*Agree* and 5-*Strongly Agree*. The students received a physical distribution of questionnaires, to fill out the form. The completed responses were manually typed into an excel sheet and then run through SPSS 21 for factor analysis and reliability tests.

Data Analysis and Findings

- **Reliability and Validity Analysis**

The study adopts factor analysis to calculate the constructed authenticity by applying KMO (Kaiser Mayer Olkin). The higher the KMO value is appropriate for the factor analysis. The sample adequacy above 0.5 justifies factor analysis.

Table-1: KMO and Bartlett's Test

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.741
Bartlett's Test of Sphericity	Approx. Chi-Square	391.922
	df	55
	Sig.	.000

As per the table above, the KMO value is 0.741, which indicates the sample collected is appropriate and fit for factor analysis and the questionnaire has sufficient construct.

- **Correlation Analysis**

The relationship between independent and dependent variables has been determined using correlation analysis. Samples to be tested are dependent on questions about every construct. The results of the correlation test are shown below.

Table-2: Correlation analysis

Correlations

		pu	peou	iu
pu	Pearson Correlation	1	.287**	.702**
	Sig. (2-tailed)		.000	.000
	N	158	158	158
peou	Pearson Correlation	.287**	1	.700**
	Sig. (2-tailed)	.000		.000
	N	158	158	158
iu	Pearson Correlation	.702**	.700**	1
	Sig. (2-tailed)	.000	.000	
	N	158	158	158

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

As Table shows, factors of the Technology Acceptance Model (TAM) are correlated with each other positively as Pearson correlation coefficient ranging from 0.28 to 0.70. The highest correlation is between perceived ease of use of the Digital Smart Board (PEOU) and Intention n to use of Digital Smart Board (IU).

• **Regression analysis**

Regression analysis is conducted to validate the relationship between the dependent and independent variables. The results are shown below:

Table-3: Regression analysis

Independent variable	Dependent variable	Beta	P value
PU of Digital Smart Board	IU of Digital Smart Board	.516	.000
PEOU of Digital Smart Board	IU of Digital Smart Board	.434	.000
PEOU of Digital Smart Board	PU of Digital Smart Board	.243	.000

The results clearly show that there is a positive relationship between the independent and dependent variables at 1 per cent significance level.

Figure-3: Path analysis
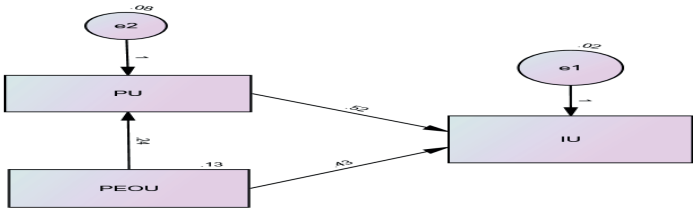
Table-4: Regression Weight

Hypotheses	Relation	Estimate	S.E.	C.R.	P	Result
H1	IU <--- PU	.516	.038	13.484	***	Supported
H2	IU <--- PEOU	.434	.032	13.421	***	Supported
H3	PU <--- PEOU	.243	.065	3.757	***	Supported

The first hypothesis, namely H1, is that perceived usefulness, i.e., PU, will enhance the user's intention to use the Digital Smart Board. The result of the study revealed that PU has a positive influence on IU (β=0.516 & p<0.01) at 1 per cent significance level. This shows that the perceived usefulness of digital smart boards attracts users to use.

Similarly, the second hypothesis, namely H2, is that perceived ease of use will enhance the user's intention to use the Digital Smart Board. The result of the study confirms that PEOU has a significant influence on IU (β=0.434 & p<0.01) at 1 per cent significance level.

Lastly, the Third Hypothesis, Namely H3, is that there exists a positive

relationship between perceived ease of use and the user's perceived usefulness of Digital Smart Board. The result of the study confirms that PEOU has a positive influence on PU (β=0.243 & p<0.01) at 1 per cent significance level.

Interpretation and Conclusion

The research has been executed to validate the Technology Acceptance Model (TAM), i.e., establish a relationship between PEOU, PU, and IU towards the usage of the Digital Smart Board in Delhi government schools. As per the data analysis, the intention to use the digital smart board is strongly dependent on the perceived usefulness and perceived ease of use of technology. The perceived usefulness of the technology is not strongly dependent on its perceived Ease of use.

The findings from the surveyed data provide significant evidence in support of the proposed acceptance model of the Digital Smart Board. They are also matching the TAM model of Davis (1996) and the study conducted by Lee (2006). Results showed that students benefited from the Digital Smart Board to improve their knowledge and get interested because of the new teaching pedagogy. We can conclude that the learners are proactive in class because of the engaging content. They feel connected with the lessons taught. The adoption of a Digital Smart Board in Classroom will enhance the learning outcomes. Therefore, the administration of the Delhi Government can integrate this technology for educational purposes. They should conduct more training for educators and promote its usage. The wider use of the Digital Smartboard is recommended in the endeavour to revolutionise the education system in Delhi.

The result of this study provides valuable feedback to the education departments of other states to adopt and integrate Digital Smart Board Technology in their classroom, thereby strengthening the quality of education overall.

References

Berdie, D. R. (1954). *Reassessing the value of high response rates to mail surveys. Mark. Res..,1*(3): 52-64.

Byrne R M. (1998). *Structural equation modelling with Liesel, Perlis and Smplis Lawrence Erlbaum Associates*, *1.* doi.org/10.4324/9780203774762

Chuttur, M.Y. (2009). *Overview of the technology acceptance model: origins, developments, and future directions. Sprouts: Working papers on Information Systems*, *9*, 37, 1–21.

Davis, F.D. (1989). *Perceived usefulness, perceived case of use and user acceptance of information technology, MIS Q., 13*(3). 319-340.

Hasan, B, and MU Ahmed, (2007). *Effects of interface style on user perceptions and behavioural intention to use computer systems*, *Comput. Hum Behav, 2316*, 3025-3037.

Hsiao, C.H., Yang, C.,(2011). *The intellectual development of the technology acceptance model: A co-citation analysis. Int. J. Inf. Manag. 31*, 128–136

Janelle Cox(2019, https://www.teachhub.com/technology-in-the-classroom/2019/10/technology-in-the-classroom-the-benefits-of-smart-boards/

King, W.R., He, J., (2006). *A meta-analysis of the technology acceptance model*. *Inf. Manag. 43*, 740–755.

Lee, Y., Kozar, K.A., Larsen, K.R.T.(2003): *The technology acceptance model: Past, present, and future. Commun. Assoc. Inf. Syst. 12*(50), 752–780.

Lee, Y.-C. (2006). *An Empirical Investigation into Factors Influencing the Adoption of an e-Learning System. Online Information Review*, 30, 517-541.

Legris, P., Ingham, J., Collerette, P.(2003) *Why do people use information technology? A critical review of the technology acceptance model. Inf. Manag. 40*, 191–204.

Martins, LL and F.W. Kellermanns, (2004). *A model of business school students' acceptance of a web-based course management system, Academy of Management Learning & Education, 3*(1):7-26.

McAdams, A.C., Kalaldeh, T.Al& Al-Sa'eed, Mo'taz Amin (2010). *Journal of Theoretical and Applied Information Technology11*(1):30-44.

Nagadeepa C., Reenu Mohan (2019), *Technology acceptance model (TAM) and Digital Technology usage: An empirical study among Teachers and Students*, IJRAR February 2019, Volume 6, Issue 1

Sharp, J.H., (2007). *Development, extension, and application: A review of the technology acceptance model*. *Inf. Syst. Educ. J. 5*(9), 1–11.

Turner, M., Kitchenham, B., Brereton, P., Charters, S., Budgen, D.,(2010). *Does the technology acceptance model predict actual use? A systematic literature review. Inf. Softw. Technol. 52*, 463–479.

Thierry KARSENTI (2016), *The Interactive Whiteboard (IWB): Uses, Benefits, and Challenges. Canadian Journal of Learning and Technology*, v42 n5 spec iss Fall 2016

Appendix

Appendix1 Questionnaire Questions

(For Students)

Name: _____

School: _____

Gender: Š Male Š Female

Instructions: Please indicate your level of agreement with the statements listed below in #1-11.

1.	Digital Smart Boards improves learning in class	Strongly	Disagree	Neutral	Agree	
2.	Learning is faster with digital technology and systems	Strongly	Disagree	Neutral	Agree	
3.	It is easier to learn with the use of the Digital Smart Boards	1	2	3	4	5
4.	Concepts are better understood when taught using Digital Smart Boards	m	m	m	m	m
5.	It is easy to operate Digital Smart Boards.	m	m	m	m	m
6.	The interaction with Digital Smart Boards is clear and understandable	m	m	m	m	m
7.	Digital Smart Boards features are easy to understand and use	m	m	m	m	m
8.	I consider that Digital Smart Boards is easy to use	m	m	m	m	m
9.	I would like to use more of Digital Smart Boards for learning	m	m	m	m	m
10.	I want my school to use more digital devices like Digital Smart Boards for teaching	m	m	m	m	m
11.	It is beneficial to use and learn from Digital Smart Boards	m	m	m	m	mñø

Appendix 2 Frequencies (mode), Constructs and Questions Categorization

Sl. No.	Construct Items	Strongly Disagree % 1	Disagree % 2	Neutral % 3	Agree % 4	Strongly Agree% 5	Code %	Mode %
	Perceived Usefulness							
1	Digital Smart Boards improves learning in class	0	0	0.63	18.9	80.3	U1	5
2	Learning is faster with digital technology and systems	0	0	3.16	70.25	26.58	U2	4
3	It is easier to learn with the use of the Digital Smart Boards	0	0	1.27	23.42	75.32	U3	5
4	Concepts are better understood when taught using Digital Smart Boards	0	0	0	22.78	77.22	U4	5
	Perceived Ease of Use							
5	It is easy to operate Digital Smart Boards	0	0	3.16	42.41	54.43	EU1	5
6	The interaction with Digital Smart Boards is clear and understa-ndable	0	0	3.8	50.63	45.57	EU2	4
7	Digital Smart Boards features are easy to understand and use	0	0	1.9	46.84	51.27	EU3	5

8	I consider that Digital Smart Boards is easy to use	0	0	1.9	39.87	58.23	EU4	5
	Intention to use							
9	I would like to use more of Digital Smart Boards for learning	0	0	0.63	27.85	71.52	IU1	5
10	I want my school to use more digital devices like Digital Smart Boards for teaching	0	0	0.63	25.32	74.05	IU2	5
11	It is beneficial to use and learn from Digital Smart Boards	0	0	0	32.28	67.72	IU3	5