

Psychological Analysis of Effectiveness of Google Classroom in Acceptance Model

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ABSTRACT

This research investigates the effectiveness of Google Classroom in enhancing students' learning using the Technology Acceptance Model (TAM). A quantitative approach utilizing route analysis was employed, with a sample of 150 college students. Data was collected through online surveys utilizing a Likert scale, and the data analysis was conducted using SmartPLS Version 3.0. The results demonstrate that the utilization of Google Classroom, in conjunction with TAM, provides students with increased autonomy in their learning process. The platform facilitates self-improvement among TAM-adhering professors through independent research, contributing to knowledge development, effective learning process management, and evaluation of its effectiveness. Integrating Google Classroom based on the TAM framework has the potential to enhance learning effectiveness and provide better academic support in higher education institutions. This study highlights the importance of integrating technology effectively in the education sector, particularly in promoting self-directed learning and improving the overall learning process. The findings suggest that the utilization of Google Classroom, in alignment with the TAM framework, can significantly enhance students' learning experiences. Therefore, educational institutions and educators should consider incorporating Google Classroom and similar technology-based platforms into their teaching methodologies to promote effective learning outcomes.

Keywords: google classroom, effectiveness, utilization, higher education, Technology Acceptance Model (TAM).

INTRODUCTION

The fourth industrial revolution, which is characterized by the fast advancement of science, technology, and information, calls for the creation of essential capital, particularly high-caliber human resources (Berardinelli et al., 2018). To produce quality human resources, as stated in Law Number 20 of 2003 Article 3 on the National Education System, which describes the objectives of education in Indonesia, quality education is the only way to succeed. The purpose of the national education system is to constantly block innovation in the fields of learning and education (never-ending process). Changes aimed at raising the standard of education and learning in a nation include competency-based education and learning. Teachers have exploited the accessibility of technology to raise the quality of instruction. According to Selvaraj et al. (2021), technology advancement brings about changes in how teaching and learning are implemented. It is acceptable to use information technology as a medium for carrying out educational procedures, such as learning and teaching, which also require looking up references and other sources of knowledge (Zhang et al., 2019). As a result, Indonesia is using the internet and other information technologies at an increasing rate each year. The usage of the internet is widespread, particularly in education. Due to the fact that so many students utilize it to enhance their learning,

the internet has an impact on the subject of education. The millennial generation makes up the majority of internet users. The 2017 poll on internet users by age conducted by the Indonesian Internet Service Provider Association (APJII), 49.52 percent of internet users in Indonesia are between the ages of 19 and 34. This proves that the millennial generation is responsible for Indonesia's high internet penetration rate. This is due to the fact that this generation was raised at a period of fast technological and internet growth. This generation expects access to all information at anytime and anywhere utilizing a device. The educational system has been profoundly influenced by the fast development of information and communication technology. E-learning is increasingly widely used by academics to enhance communication and information sharing between lecturers and students as well as the learning process for students. E-learning is a kind of instruction that improves teaching and learning activities, especially at universities where lecturers, in this case, are supposed to be professionals, according to Al-Fraihat et al. (2020). Thus, the term "e-learning" in this setting refers to a method of education that makes use of IT and is facilitated by an online connection.

In the realm of education, Google ranks among the most popular online learning resources. The newest Google product, Google Apps For Education (GAPE), was released the same year. Google Apps For Education (GAPE), a technology platform produced and developed exclusively for the educational sector, includes Google Classroom as one of its features and promotes the integration of information technology with online collaboration (Jay et al., 2019). Due to the time savings, using Google Classroom facilitates learning for instructors and students (Al Abri et al., 2020). This is due to the fact that Google Classroom can be viewed from any device with an internet connection, including PCs, Android and iOS-based mobile devices, and tablets. Google Classroom allows for digital communication between educators and students, streamlining the circulation of course materials and the assignment of assignments. The use of Google Classroom offers a lot of benefits, including the ability for students to participate in online conversations with teachers or other students. Many higher education institutions continue to employ lecturer-centered learning as one of their primary teaching strategies, where the speaker makes use of visualizers, blackboards, and presentation slides as visual aids. This most definitely does not provide pupils access to modern learning opportunities (adaptive technology). The outcome is fewer effective learning activities in class since pupils feel unsatisfied (bored) with their education. Since higher education offers lessons for workers, the use of conventional learning techniques is thus not practical and does not satisfy the need for learning in the classroom. Students' performance in class might be influenced by using Google Classroom in the ways outlined above. The efficacy of lecturing in higher education calls for an analysis of Google Classroom's implementation. Researchers evaluated Google Classroom's efficacy by applying the TAM (Technology Acceptance Model) developed by Grover et al. (2019).

Despite the growing use of technology in education, including the adoption of learning management systems like Google Classroom, there is still a research gap regarding the effectiveness of these platforms specifically in the Philippine context. While studies from other countries have examined the impact of Google Classroom on student learning outcomes, there is a need for research that investigates its effectiveness and acceptance among Filipino students and educators. Additionally, there is a lack of studies exploring the alignment of Google Classroom with the Technology Acceptance Model (TAM) in the Philippine educational setting. TAM provides a theoretical framework to understand users' acceptance and adoption of technology, but its applicability and effectiveness within the Philippine context need to be explored further. Furthermore, the specific benefits and challenges of implementing Google Classroom in Philippine schools and universities have not been extensively investigated. Factors such as infrastructure limitations, access to technology, teacher readiness, and student acceptance may differ in the Philippine educational landscape, and understanding these unique contextual factors is crucial for successful implementation and utilization of Google Classroom. There is a research gap in the Philippines regarding the effectiveness of Google Classroom as an educational technology tool, its alignment with the Technology Acceptance Model, and the specific benefits and challenges of its implementation in the Philippine educational context. Further research in these areas would contribute to the advancement of technology-enhanced learning practices in the Philippines and provide valuable insights for educational institutions and policymakers.

LITERATURE REVIEW

a.E-Learning

E-Learning, also known as web-based learning, makes use of various forms of technology and information that can be accessed from a remote location. This allows for learning to take place not only in a traditional classroom setting and during predetermined hours, but also in any location and at any time (Hofmeister & Pilz, 2020). The following are some of the features of online education: 1) the learning goals are followed by relevant information; 2) presentation of activities and examples with the goal of enhancing learning is referred to as an instructional approach; 3) conveyance of information utilizing media components, such as interactive text and graphics; 4) both teacher-centered (synchronous e-learning) and autonomous learning (asynchronous e-learning); 5) develop knowledge and abilities both individually and collectively that may enhance learning performance (Affouneh et al., 2020). E-learning is a trend in education that represents a learning innovation (Maatuk et al., 2022). This is due to the fact that e-learning may overcome the drawbacks of traditionally delivered education (and education in general), such as its time and space constraints.

b.Google Classroom

Google Classroom is a digital tool made available via the e-learning platform (Oyarinde & Komolafe, 2020). Google Classroom, which requires a Google account from service users, is intended to let professors provide students paperless materials and assignments (Rahmad et al., 2019). Another feature offered by Google Classroom is the ability for lecturers to design tasks that students may complete online within a certain time frame. The collection history on the assignment wall may be used to determine which students are delayed in picking up their assignments. This exemplifies how Google Classroom circumvents the time and space limitations of conventional methods. Teachers can more easily assess their students' progress in class thanks to Google Classroom. If issues are identified and fixed with the aid of Google Classroom's activity monitoring features, students' educational experiences will be enhanced (Kumar & Bervell, 2019).

c.Technology Acceptance Model (TAM)

Grover et al. (2019) established a customer paradigm called the Technology Acceptance Paradigm (TAM). The notion of what drives or motivates people to utilize technology, as outlined by the Theory of Reasoned Action (TRA), informed the creation of this paradigm. Perceived usability and perceived ease of use, according to Grover et al. (2019), are the two factors that affect how technology users behave in comparison to technology adopters. It is thought that both of these elements work in concert to affect users' intentions to utilize the system or technology (Stockless, 2018). The TAM model has therefore been put to the test as a gauge of technological acceptability based on how its users see it. The following image provides a detailed explanation of the methodology for analyzing user behavior based on this TAM model:

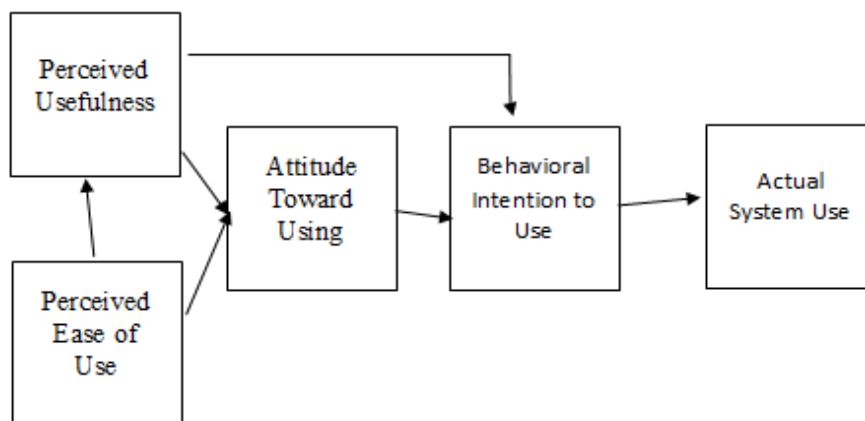


Figure 1. Platform for TAM Model-Based User Behavior Evaluation

The figure above makes it apparent that people who use technology will be interested in utilizing it if they believe the system or technology is practical and simple to use. This is undoubtedly a way to gauge how well a

person or organization uses technology to enhance performance and make tasks easier for consumers to do (Szymkowiak & Jegathan, 2022).

a. Perceived Ease of Use

When people have the impression that using a piece of information technology won't need much of their time or energy, we say that it has a perceived ease of use (Astari et al., 2022; Andri, 2022). The current research employs the idea of ease to evaluate the accessibility, usability, and practicality of Google Classroom for teachers using the TAM.

b. Perceived Usefulness

A system's or technology's perceived usefulness is a measurement of a person's perception of it as a tool for improving performance at work (Kissi & Dreesmann, 2018). This study looked at how switching from more conventional teaching methods to ones based on TAM affected students' opinions of Google Classroom's efficacy.

c. Learning Effectiveness

Accuracy in a planned task is a measure of effectiveness. Effectiveness may also be seen as a notion that encompasses a range of internal and external elements (Carmichael et al., 2018). Effectiveness is not just determined by outcomes, but also by perception, attitude, and the level of job satisfaction that an individual experiences. The capacity of a person or group of individuals to manage and create an environment that inspires pupils to be imaginative and resourceful in their task-solving is known as learning effectiveness (Dhakal 2022). Additionally, Toan et al. (2021) clarified that a measure of a learning process' success is its degree of efficacy. Learning may thus be considered to be successful if it can be completed within a defined time frame, if all learning goals are met, and if it enables students to learn effectively and with enjoyment (Carmichael et al., 2018).

METHOD

The path analysis technique was employed in this research, utilizing a quantitative non-experimental approach for data collection (Mustika et al., 2022). The study involved 150 participants who were students enrolled in higher education institutions in the Philippines. To gather data, closed questionnaires and online surveys utilizing a Likert scale were administered through the Google Forms application. In the Philippine context, the use of Google Classroom and its effectiveness were examined through the lens of path analysis. The study aimed to explore the relationship between variables related to the acceptance and utilization of Google Classroom among Filipino students. The participants, representing the Philippine student population, provided valuable insights into their experiences and perceptions regarding Google Classroom. Descriptive statistics were employed to analyze demographic information of Google Classroom users within the Philippine context. This allowed for a better understanding of the characteristics and backgrounds of the participants in relation to their usage of the platform. Furthermore, inferential statistics were utilized to identify the outer model, inner models, and test hypotheses. This statistical analysis enabled the researchers to assess the relationships and associations between variables within the TAM framework specific to the Philippine educational landscape. By contextualizing the research within the Philippines, this study contributes to the understanding of the effectiveness and acceptance of Google Classroom within the local educational context. The findings derived from the data collected from Filipino students can inform educators, institutions, and policymakers in the Philippines in making informed decisions regarding the implementation and utilization of Google Classroom as an educational technology tool.

a. Perceived Ease of Use of TAM-based Google Classroom: Effects on Adoption

The perceived ease of use of TAM-based Google Classroom indicate that little effort is required by a user once they get used to it. According to Vitoria et al. (2018), the user, procedures, and technology are the three primary components needed for the effective implementation of online learning. Users link to students' and instructors' motivation for using the TAM-based Google Classroom as well as their capacity to do so. The procedure has to do with how Google Classroom is used in educational tasks. Technology is connected to the infrastructure for using TAM-based Google Classroom (such as a device, PC, or tablet). The likelihood that students will utilize

TAM-based Google Classroom is thought to increase if these three factors, which contribute to perceived ease of use, are present.

H1: The adoption of Google Classroom based on TAM is influenced by perceived ease of use.

b. Google Classroom: The Role of Perceived Usefulness in Influencing Intention to Use TAM

A technology or information system's perceived usefulness is the extent to which an individual or organization believes it will improve operational efficiency. According to Astari et al. (2022), the usefulness assessment is based on the variety of applications utilized as well as how often they are used. Therefore, it may be claimed that a system's usefulness increases as its usefulness on performance increases. TAM-based Google Classroom is the system being utilized in this instance.

H2: Use of TAM-based Google Classroom is influenced by perceived utility.

c. The impact of using Google Classroom with TAM on learning effectiveness

The desire to utilize the system was characterized by Normayanti Putri and Usman (2021) as an interest. This demonstrates that interest is defined as having the purpose to use, to constantly attempt to use, and to continue using in the future. In this research, it is anticipated that the desire to utilize Google Classroom built on TAM would aid in successful learning. The more motivated students are to use TAM in Google Classroom, the better they will do academically. Google Classroom, built on the TAM framework, is used in conjunction with portable learning activities to provide effective instruction.

H3: Using Google Classroom with a TAM platform affects learning effectiveness.

RESULT

a. Descriptive Statistics

The sample displays the replies gathered from 160 college students. The data obtained was only 150 respondents, thus the response may be utilized after deleting online respondents who did not finish the questionnaire. Additionally, Table 1 displays the respondents' demographic data. According to the statistics, there were 52% female and 48% male pupils. In addition, 63.3% of the student body was between the ages of 18 and 22. According to the department, the management department had 43.3% of the students; the education department had 33.3%; the information technology department had 16.7%; and the midwifery and nursing department had 6.7%. According to the year of study, 41.3% of learners were in their first year, 30.7% were in their second year, and 14% were in their third and fourth. 67% of students had used Google Classroom for their education for three months at the time this was written. Additionally, Google Classroom was utilized in the educational process by 76% of the students. Additionally, the findings revealed that 22% of students preferred studying via Google Classroom, while 19% chose traditional learning, and 60% of students favored both types of learning.

Table 1. Respondents' Profile

Item	Values	Frequency	Percentage(%)
Sex	Female	78	52
	Male	72	48
Age	18to 22 years old	95	63.3
	23to 28 years old	35	23.3
	Above 28 years old	20	13.3
Department	Education	50	33.3
	Management	65	43.3
	Information Technology	25	16.7
	Midwiferyand Nursing	10	6.7
Year	1 st year	62	41.3
	2 nd year	46	30.7
	3 rd year	21	14
	4 th year	21	14

b.Measurement Model Assessment

The evaluation model known as the measurement model or outer model illustrates how latent variables and indicators relate to one another. Using the SmartPLS 3.0 program, this outer model assessment assesses the model's dependability and validity (Sarstedt & Cheah, 2019).

According to Hair et al. (2021) the Average Variance Extracted (AVE) value may be used to evaluate the accuracy and reliability of an app. Each indicator variable's loading factor must be larger than 0.70, and the AVE must be greater than 0.50. The symptoms seem to be credible and understandable. The following table displays the outer model's data processing results from the investigation.

Table 2. Findings of a Measurement Model

Constructs	Items	Cronbach's Alpha	Composite reliability	Average Variance Extracted
Exogenous Variable □ Perceived ease of use (A1)	A1.1	0.869	0.879	0.598
	A1.2	0.859		
	A1.3	0.833		
	A1.4	0.865		
	A1.5	0.846		
	A1.6	0.474		
	A1.7	0.569		
Exogenous Variable □ Perceived Usefulness (A2)	A2.1	0.839	0.919	0.715
	A2.2	0.861		
	A2.3	0.849		
	A2.4	0.859		
	A2.5	0.767		
	A2.6	0.885		
Mediating Variable □ Utilization of TAM-based Google Classroom (B1)	B1.1	0.892	0.872	0.798
	B1.2	0.893		
	B1.3	0.890		
Endogenous Variable □ Learning Effectiveness (B2)	B2.1	0.911	0.813	0.844
	B2.2	0.925		

Table 2

Every item was reliable and met the criteria, although A1.6 and A1.7 were taken out of the building structure since their Cronbach's Alpha values were below 0.7. All constructs received composite reliability scores more than 0.70, demonstrating the trustworthiness of all variables. Additionally, each variable's AVE (Average Variance Extracted) value exceeded 0.50. This demonstrates that the indicators' fluctuations within the variables were homogenous and useful. Each indicator's factor loading value was higher than 0.70. The following is shown in Table 3:

Table 3. Outcomes of Cross Loading

	Y2	Y1	X1	X2
B2.1	0.911	0.598	0.560	0.506
B2.2	0.925	0.638	0.568	0.572
B1.1	0.559	0.894	0.652	0.596
B1.2	0.641	0.895	0.660	0.621
B1.3	0.601	0.892	0.673	0.604
A2.1	0.493	0.668	0.839	0.640
A2.2	0.575	0.604	0.863	0.663

A2.3	0.557	0.666	0.849	0.650
A2.4	0.529	0.610	0.859	0.673
A2.5	0.410	0.537	0.768	0.602
A2.6	0.539	0.665	0.887	0.683
A1.1	0.541	0.608	0.699	0.867
A1.2	0.512	0.576	0.643	0.857
A3	0.479	0.548	0.684	0.831
A1.4	0.499	0.589	0.666	0.863
A1.5	0.448	0.540	0.644	0.844

c. Structural Model Assessment

In order to determine if there is a link between external and endogenous variables and whether the inner model can support the suggested hypothesis, it must be evaluated. Examining the inner model evaluation may be done using the coefficient of determination analysis (R²) and path coefficient analysis (structural model assessment). Each variable's coefficient of determination (R²) has a different value, with the perceived ease of use variable having an R² value of 58.7%, the perceived usefulness variable having an R² value of 55.8%, the use of Google Classroom built on TAM having an R² value of 56.4%, and the learning effectiveness variables having an R² value of 45.3%. The impact of each exogenous variable on endogenous variables was also examined using path coefficient analysis. When the suggested hypothesis in the following table may be answered by the route analysis:

Table 4. Hypotheses Test Results

Hypothesis	Path	Path Coefficient	p-value	Remarks
H1	A1àB1	0.765	0.000	Accepted
H2	A2àB1	0.589	0.000	Accepted
H3	B1àB2	0.672	0.000	Accepted

All of the presented hypotheses were determined to be accepted according to the findings of this study's hypothesis testing.

DISCUSSION

a. Perceived Ease of Use of TAM-based Google Classroom: Effects on Adoption

The utilization of Google Classroom, which was based on TAM, was influenced by perceived ease of use. This is in accordance with a research by Vitoria et al. (2018), which found that the user, processes, and technology are the three essential elements required for the successful implementation of online learning. Users link to students' and instructors' motivation for using the TAM-based Google Classroom as well as their capacity to do so. The procedure has to do with how Google Classroom is used in educational tasks. Technology is connected to the infrastructure for using TAM-based Google Classroom (such as a device, PC, or tablet). In this instance, Google Classroom's TAM-based perceived usability included those three features. Therefore, it can be claimed that students in higher education may utilize Google Classroom that is based on TAM to a greater extent if they believe it to be easy to use. This is due to the fact that the TAM-based Google Classroom streamlines the lecture process for both lecturers and students. The benefit for professors is how simple it is to provide students homework, information, and material. Despite the fact that pupils benefit from the convenience of instant information access

b. The Impact of Perceived Usefulness on Google Classroom Based on TAM

The use of TAM-based Google Classroom was influenced by perceived usefulness. It goes without saying that using Google Classroom on a TAM platform may be advantageous for both professors and students during lectures. The distribution of information is believed to benefit by using TAM-based Google Classroom, which may also improve work performance (Astari et al., 2022; Andri, 2022). It might be argued that the TAM-based Google Classroom information system or technology is beneficial in raising performance and could raise the

motivation to utilize information systems or technologies. As a result, it's plausible that implementing a TAM-based Google Classroom might boost class efficiency. One may also argue that Google Classroom is a great tool for improving the lecturing process at universities.

c. Use of Google Classroom based on TAM and Learning Effectiveness

Using Google Classroom has an influence on how well students learned, according to TAM. This is in line with a research that discovered one of the participants' interests was utilizing the system (TAM-based Google Classroom). This demonstrates that interest is defined by a desire to use, a want to use again, and an anticipation of future usage (Normayanti Putri & Usman, 2021). This, of course, suggests that the usage of Google Classroom may be considered as part of a strategy to improve educational outcomes. Google Classroom should be utilized in the classroom to enhance the educational experience. This is consistent with a number of studies, including those by Sibuea (2018), Romero and Artal-Sevil (2019), Syakur (2020), and Untari and Millatussa'adiyah (2020), which explained that the use of Google Classroom can improve the effectiveness and efficiency of learning in higher education. This is due to the fact that using Google Classroom speeds up communication and information delivery without requiring students to physically interact in class. Therefore, the learning process is more effective if instructors and students use Google Classroom that is TAM-based.

CONCLUSION

The research's results allow us to make the conclusion that the perceived usefulness of Google Classroom's TAM-based platform was positively correlated with how straightforward it was to use. In line with the platform's perceived usability and perceived simplicity of use, Google Classroom on TAM will become more widely used. This shows that there is a great deal of interest in utilizing Google Classroom, which is built on TAM, in higher education. For instance, when it comes to usability, students may quickly and correctly get content that is directly related to the subject at hand and the homework that has been assigned. Regarding its usefulness, using Google Classroom could lead to an improvement in work output. Because of this, Google Classroom with TAM might potentially improve students' academic outcomes. By enhancing students' study skills, using TAM-based Google Classroom would boost the quality of academic services offered at the university level. As a result, it is anticipated that the future study would use different research methodologies in order to include additional components, such as Google Classroom performance or the usage of e-management in connection to the quality of student academic services.

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