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Technology Acceptance of Google Classroom Online Learning Portal among College Teachers

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Abstract

Google Classroom, a widely utilized Learning Management System for online instruction, served as the focal point of this research. This study is relevant to Malaysia's continuously evolving online education landscape within higher education. Utilizing a quantitative cross-sectional survey design approach, the research was grounded in the Technology Acceptance Model (TAM), which provided a structured framework for evaluating the factors influencing the acceptance of Google Classroom technology. The analysis employed descriptive statistics, correlation, and regression techniques to assess the relationships among variables. The findings revealed high acceptance levels for most factors except for Readiness for Google Classroom Technology. Notably, the study found a strong positive relationship between Perceived Ease of Use and Readiness to Accept Technology. In contrast, the relationships between Perceived Usefulness and Social Influence were found to be of moderate strength. Additionally, the model accounted for 58% of the variance in Readiness to Accept Technology, indicating a substantial effect size. These findings underscore the necessity for implementing comprehensive teacher training programs designed to aid educators in adapting to the changing educational environment and keeping up with recent developments in pedagogical frameworks.

Keywords*:* TAM, Online Learning, LMS, Google Classroom, Social Influence.

Introduction

The Learning Management System (LMS) is rapidly evolving and crucial in today's Malaysian higher education system. It is extensively utilized to deliver online learning services to teachers, administrators, and students (Wong & Nasir, 2024). The global e-learning market is predicted to reach nearly $435 billion by 2032 (Global Market Insights, 2023). Despite students being physically distant, teachers or lecturers utilize all their creativity to interact with their students online (Jafar, 2020). Traditional teaching and learning methods are currently teacher-centered, where teachers or lecturers use visual aids such as presentation slides, whiteboards, and visualizers (Ramli et al., 2018). Today, online learning also employs similar methods, such as presentation slides, visualizers, and the ability to demonstrate

sketches while teaching online (Urzúa et al., 2019). The difference lies in teachers and students being in different locations, but classes are conducted virtually online.

However, whether fully or hybrid, online teaching and learning methods have not been fully implemented in developing countries, including Malaysia. Teachers, students, and parents have yet to fully understand online classes' advantages and functions. The lack of suitable supporting devices poses a significant obstacle for individuals to effectively utilize modern technology (Smith et al., 2020). Most of the population faces challenges due to insufficient access to suitable devices, which makes it difficult to harness the potential of technological advancements (Manimaran & Nasir, 2024). The Malaysian government has planned several new alternatives to promote the widespread use of e-learning among the public (Mardiah, 2020). However, this method requires careful planning and time to implement the strategies designed to familiarize the community with supporting devices. Therefore, parents are encouraged to have suitable devices to facilitate their children's success in e-learning classes with their teachers at home. This initiative must be taken to guarantee that learning routines can be effectively implemented as usual, even when facing situations that prevent them from going to school (Ni et al., 2021).

Furthermore, there is a potential for the emergence of technology issues among the involved teachers, where one of the problems is the difficulty teachers face in embracing digital technology as a teaching aid (Scherer et al., 2019). Therefore, there is a need to clarify this phenomenon, as Malaysian teachers have been exposed to technological devices and 21st-century Teaching and Learning Innovations (PDP). Researchers such as Al-Rahmi et al. (2019) claim that this failure stems from the perspective of acceptance of technology factors. Thus, this study is aimed to assess the level and the relationship of all variables. It also seeks to identify the factors contributing most to teachers' Readiness to accept Google Classroom (GC) technology. Below are the research questions involved in this study.

1) What is the degree of Perceived Usefulness, Perceived Ease of Use, Social Influence, and Readiness among teachers to accept GC technology?
2) Is there an association between Perceived Usefulness, Perceived Ease of Use, and SI on the Readiness to accept GC technology among teachers teaching?
3) Which factors are the most significant in determining teachers' degree of readiness for acceptance of GC technology?

Literature Review

Learning Management System

In the current digital era, the LMS has emerged as an essential element in facilitating learning. LMS provides solutions for distance learning, collaboration between teachers and students, and access to learning resources (Johnson, 2019). LMS has emerged as an indispensable tool for delivering instructional content, managing coursework, and facilitating communication between educators and students (Garcia & Patel, 2022). There are various types of LMS, such as Moodle, Blackboard, Frog, and GC. The latest technological developments have substantially influenced the advancement of LMS. Integrating artificial intelligence and learning data analysis allows for better online learning than before (Kumar et al., 2019; Nasir, 2020).

Google Classroom

Mohamed and Syamsuddin (2020) explain that the Google application provides GC as a free teaching space. Unlike traditional learning, this platform allows teachers and students to

conduct teaching and learning sessions and assign tasks to students without physically attending classes. Additionally, GC has excellent features that allow teachers and students to share files and notes related to the subjects studied. Teachers can also provide assignments and receive completed assignments from students for assessment. Efficient communication features, organized assignment management, integration with collaborative tools, and emphasis on personal feedback contribute to its widespread use (Jones et al., 2023). The function of GC makes it a vital platform that enables educators to create interactive learning environments and prepares students to master technology.

Google Classroom in Malaysia

GC was introduced in 2014. Therefore, only a few studies have examined its functionality. Jamiludin et al (2019) examined interactive learning activities in GC, applying the Technology Acceptance Model (TAM) to assess the efficiency of the activities presented within the platform. The results from 100 students showed that GC demonstrated notably superior performance in communication, interaction, user-friendliness, and overall student contentment. Ahmad et al (2020) explored the implementation of GC in Malaysian educational institutions and found that it becomes a challenge for higher education to conduct learning activities in computer labs. The most practical subjects, such as data mining, either natural or demonstrative, in computer labs emphasize observation skills acquisition. This allows students to see ideas handled in action and link theory with reality. Nonetheless, students frequently express negative sentiments toward practical work due to their inefficiency in laboratory tasks, reflecting students' perception of a lack of clear objectives for lab tasks.

Technology Acceptance Model (TAM)

The TAM represents a theoretical framework that provides insights into the aspects influencing individuals' acceptance of technology. It consists of two primary components, namely Perceived Ease of Use (PEU) and Perceived Usefulness (PU), which refer to individuals' attitudes and intentions in using technology (Davis, 1989). Researchers have used TAM to comprehend the aspects impacting the adoption of e-learning platforms among students and educators. They examined how perceptions of usefulness and ease of use influence the willingness to use online learning tools (Al-Rahmi et al., 2018). Based on recent research, perceptions of usefulness, perceived ease of use, social influence, and prior technology experience are essential in influencing the acceptance and use of GC in educational settings.

Perceived Usefulness in Google Classroom

According to the TAM model, PU is the extent individuals believe that employing a specific system will augment their task productivity. This concept refers to users' perceptions of the outcomes of their experiences (Davis, 1989). Davis (1989) defines it as individuals' perception that adopting new technology will enhance their performance. Similarly, according to Zhang et al (2020), the PU perception is used to assess the acceptance of virtual classrooms and video discussion platforms in distance education. They examined educators' perceptions of the usefulness of these tools for conducting online classes directly and facilitating interaction with students (Mukhtar & Nasir, 2023). The PU of GC has been a critical factor in influencing teachers' intentions and behaviors when using this platform.

Perceived Ease of Use in Google Classroom

Rogers (1962) asserts that PEU is a concept that delineates the degree to which an innovation is perceived as easy to understand, learn, or utilize, emphasizing its user-friendliness and accessibility. It is stated that PEU is the extent to which users perceive a new product or service as being better than its alternatives (Rogers, 1983). Hew et al (2019) demonstrate that PEU positively influences student engagement with educational technology. In the context of GC, students find this platform user-friendly, and it encourages them to engage actively in discussions, submit assignments, and participate in collaborative activities.

Social Influence in Google Classroom

According to Johnson et al (2021), SI (SI) significantly influences the use of GC. Teachers and students report that interaction with peers and instructors has influenced their decision to adopt this technology. They observe that classmates' involvement and cooperation in GC have encouraged them to participate more actively (Nasir, 2020). This concept is similar to subjective norms in the Theory of Planned Behavior, which asserts that positive SI leads individuals to have a solid intention to perform a specific action.

Readiness to Accept Technology

The readiness to accept technology in education has become a significant focus. With the rapid advancement of IT, various tools and platforms have been introduced to enhance teaching and learning. The acceptance of Google Classroom is driven by technological readiness, attitude toward technology, and organizational support. Venkatesh et al (2012) developed the Extended Technology Acceptance Model, which introduces additional factors such as user experience and perceived value as essential to technology acceptance. Their study indicates that user experience and perceived value are crucial in determining technology acceptance, which also pertains to the readiness of technology Google Classroom.

Methodology

Research Design

This study applied the cross-sectional survey method research design. It aims to elucidate the relationship between PU, PEU, and SI regarding the readiness of teachers in Malaysian schools to accept GC technology. This design is appropriate for this study as it allows for gathering respondents' data only once.

Population and Samples

The study participants comprised 200 teachers from primary and secondary schools at a College in Negeri Sembilan, Malaysia. This sample includes a distribution of gender, ethnicity, marital status, age, educational level, and years of work experience. The sampling technique was purposive, with homogeneous sampling focusing on individuals with similar or specific characteristics (Etikan et al., 2015).

Data Collection

The data collection procedure involves creating a questionnaire using Google Forms. The Google Form link was emailed to all primary and secondary school teachers involved in this study. Teachers were given a four-week period to respond to all survey questions.

Research Instrument and Variables

There are five main sections in the instrument. Section A pertains to the respondent's background. Respondents provide data regarding personal identity, such as gender, age, marital status, education, and length of service. Sections B and C, related to PU and PEU, were adapted from (Lee and Kozar, 2012). Meanwhile, Sections D and E, concerning SI and Readiness for acceptance, were developed and adapted from (Venkatesh et al., 2012). Table 1 below displays the total sections in the questionnaire along with their respective references.

Table 1
The total sections in the questionnaire with reference

Section	Variable	Total Items	Reference
A	Demographic	6	
B	Perceived Usefulness (PU)	6	Lee & Kozar (2012)
C	Perceived Ease of Use (PEU)	6	Lee & Kozar (2012)
D	Social Influence (SI)	6	Venkatesh, Thong & Xu (2012)
E	Readiness to Accept (RA)	8	Venkatesh, Thong & Xu (2012)

The survey instrument for this study comprises closed-ended questions and is divided into five sections. Section A pertains to questions about the respondents' background. In contrast, Sections B, C, D, and E use a 5-point Likert scale, with one representing "strongly disagree," 2 "disagree," 3 "neutral," 4 "agree," and 5 "strongly agree." The researcher allows respondents to express their opinions and perceptions regarding each statement in the questionnaire.

Validity and Reliability

Conducting this pilot study helps to generate more accurate and reliable data based on the improved questions for the actual research. The reliability of the questionnaire was evaluated using Cronbach's Alpha analysis, where the required value to obtain a reliable research instrument is a coefficient alpha of at least 0.7, which is satisfactory (Hair et al., 2016). The pilot study for this research was conducted on 30 teachers at a secondary school in Miri Sarawak, Malaysia. All variables have achieved a reasonable degree of reliability, surpassing 0.70, except for GC's technology acceptance readiness variable, which shows a weak Cronbach's alpha value. However, according to Azizi et al (2007), a reliability value for good items is considered adequate if it exceeds 0.60.

Data Analysis

SPSS software version 25.0 was used to analyze the recorded data. The obtained data is analyzed using descriptive tests to ensure no missing data or outliers may affect the study's outcome. Descriptive analysis is also utilized to address the first research question. Researchers use descriptive analysis to analyze closed-ended questionnaire data. Zamalia (2009) states that descriptive analysis involves transforming raw data into an easily understood and interpreted format.

Meanwhile, inferential statistics like the Pearson correlation analysis are also used to measure the relationship between two variables, assessing whether the independent variable contributes to the dependent variable to address the second research question. Additionally, multiple linear regression analysis is also used in this study to identify the factor of each

independent variable that contributes the most to the dependent variable. The independent variables in this study are PU, PEU, and SI. Meanwhile, the dependent variable is teachers' RA for accepting GC technology in teaching.

Findings

Respondent Demographic Information

Of the 200 of the population, only 135 teachers participated in the survey, 81 females and the remainder male. There were 80 teachers with qualifications from a bachelor's degree; 49 of them have qualifications at the Master's level, four of them have a PhD, and the rest have qualifications in Diploma. Sixty-eight of the respondents also have work experience of more than 16 years and above, while only 10 have work knowledge of less than five years.

Normality Test

A normality test is conducted to ensure that the distribution frequency for each variable is normally distributed before the analysis is carried out. Subsequently, based on the standard probability plot, the normality of data is typically measured according to the Skewness standard of ±2.0 and the Kurtosis standard of ±5.0 (George et al., 1995). Data showing a normal distribution will exhibit a study plot that forms a straight line at a 45-degree angle according to the observed values in the standard Q-Q plot (Chua, 2012). Only data that meets the specified standards was analyzed in this study. The test indicated that all variables in this study exhibit a normal distribution, and the level of each variable is shown in Table 2.

Table 2
The Results of the Normality Test Conducted for Each Variable

Descriptive Statistic	**Variable**			
	Perceived usefulness	**Perceived ease of use**	**Social Influence**	**Readiness Acceptance**
Mean	4.10	4.19	3.71	3.53
Median	4.08	4.19	3.71	3.53
Std. Deviation	0.56	0.60	0.58	0.46
Minimum	2.42	3.00	2.50	2.38
Maximum	5.00	5.00	5.00	5.00
Skewness	-0.24	-0.23	0.12	0.02
Level				
Low *(Mean 1-00-2.33)*	-	-	-	-
Moderate *(Mean 2.34-3.67)*	-	-	-	84 (62.2%)
High *(Mean 3.68-5.00)*	94 (69.6%)	103 (76.3%)	60 (44.4%)	

Research Question 1: *What is the degree of Perceived Usefulness (PU), Perceived Ease of Use (PEU), Social Influence (SI), and Readiness (RA) among teachers to accept GC technology?*

In line with the set minimum score, ranging from 1 to 2.33, which is categorized as a low level, 2.34 to 3.67 as a moderate level, and 3.68 to 5 as a high level, the following are the frequency distribution results for each variable, as shown in Table 2. The result shows that the levels of PU, PEU, and SI are high. Conversely, the level of RA of GC technology indicates a moderate degree. All of the variables in the study have no issue of skewness.

Research Question 2: *Is there an association between Perceived Usefulness (PU), Perceived Ease of Use (PEU), and SI on the Readiness to accept (RA) GC technology among teachers teaching?*

The strength of the relationship between PU and RA is a moderate and significant positive relationship r (135) = .41, p < 0.01. This indicates a considerable association of positivity between PU and RA of GC technology. The strength of the relationship between PEU and RA is solid, indicating a positive correlation r (135) = .74, p < 0.01. The relationship between SI and RA has moderate and significant strength, indicating a positive correlation r (135) = .49, p < 0.01. The result is summarized in Table 3.

Table 3
The relationship between all variables on the Readiness of GC.

Variable	PU	PEU	SI	RA
Perceived Usefulness (PU)	--	0.50**	0.58**	0.41**
Perceived Ease of Use (PEU)	--	--	0.41**	0.74**
Social Influence (SI)	--	--	--	0.49**
Readiness for Acceptance (RA)	--	--	--	--

** Correlation is significant at the 0.01 level (2-tailed)
Significance at level p < 0.05

Research Question 3: *Which factors are the most significant in determining teachers' degree of readiness for acceptance of GC technology?*

Multiple regression analysis was calculated. All three independent variables collectively explain 59 percent of the dependent variable's variance (R squared). The analysis results also indicate that this regression is significant F (3,131) = 63.16, p < 0.01). This means these variables have collectively contributed substantially and satisfactorily to explaining the Readiness for acceptance. The adjusted R squared value was .58. This indicates that the model explained 58% of the variance in RA. This indication shows a significant large effect (Cohen, 1988). The obtained t-values indicate that two variables contribute to the RA of GC technology. However, unlike PU, the PEU variable shows the highest value and is positively and significantly associated with RA. Based on the Beta values, the regression coefficient PEU took the highest beta (β=.67, p<.01), followed by SI (β=.16, p<.01), which contributed significantly to predicting RA, as summarized in Table 4.

Table 4
Simultaneous Multiple Regression Analysis

Variable	*B*	*SE B*	*β*	t	P-Value
Constant	0.86	0.22			
PU	-0.07	0.06	-0.08	-1.09	0.277
PEU	0.52	0.05	0.67**	10.23	<.001
SI	0.12	0.06	0.16**	2.16	<.001

Note: R^2 = 0.59, Adj.R^2 = 0.58; F (3,131) = 63.16, p<0.01)
*Correlation is significant at level *t >1.96; **t >2.58; ***t >3.29*

RA = Readiness to accept GC Technology, PEU = Perceived Ease of Use, PU = Perceived Usefulness, SI = Social influence
B= Unstandardized Coefficients), *β* = (Standardized Coefficients), *SE B*= Std. Error

Thus, the multiple linear regression model for this study is as follows:
RA = .86 + (-.07 PU) + (0.52 PEU) + (0.12 SI)

Discussion

The PU, PEU, and SI are essential in determining teachers' readiness to accept GC technology. The strong positive relationship between PEU and readiness suggests that GC's user-friendliness is critical to its adoption. Similarly, the significant relationship between PU and readiness highlights the importance of teachers perceiving GC as a valuable tool for enhancing their teaching effectiveness. The moderate effect of SI suggests that while peer influence is essential, it is less critical than PEU and PU in determining readiness to accept GC technology. However, the strength of this relationship between teachers' perceptions regarding the PU of using GC teaching and their readiness to accept GC technology among teachers in the college is found to be moderate. This result is supported by other researchers (Iftakhar, 2016; Dicicco, 2016; Ventayen et al., 2018; Awang et al., 2018).

The findings also indicate a significant and positive relationship between PEU and RA, which is very strong. This suggests that teachers' perceptions of the PEU of GC teaching influence their readiness to accept GC technology. A significant and positive relationship between SI and RA was found. However, the strength of this relationship is found to be moderate. This suggests that SI also affects teachers' RA in using GC teaching, as supported by the research of (Awang et al., 2018; Izwan et al., 2018). Previous research findings support this study's results, indicating a positive relationship between SI and Readiness in accepting GC technology use. The independent variable of PEU contributes the most to the RA. The primary aim of this study is to tackle the significant challenge of teachers' resistance to online learning within Malaysia's higher education system. By contributing to the creation of comprehensive training programs, the study seeks to help educators adapt to online environments, engage students effectively, and find practical solutions for technical issues, ultimately enhancing the overall quality of online education.

The national education system is continually evolving, and both schooling and learning systems must adapt to the current environment's needs, desires, and demands to serve students effectively. Consequently, information technology, such as Google Classroom (GC) and e-learning systems, is essential for conducting activities in schools and universities, leading institutions to invest in online systems and devices increasingly. However, in this age of technology, one of the primary challenges for schools and teachers is the acceptance of technology, which is crucial for adopting innovative e-learning systems that enhance and support teaching and learning.

Recommendation

Based on the study's findings, the following recommendations are proposed:

1. Develop and implement comprehensive training programs to enhance teachers' perceptions of GC technology's usefulness and ease of use.
2. Leverage social influence by encouraging peer support and teacher collaboration to foster a positive attitude towards GC technology.

3. Provide ongoing technical support to address teachers' challenges when using GC technology.
4. Conduct further research to explore other factors influencing technology acceptance in education, such as cultural and organizational factors.

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