An Empirical Investigation on Google Classroom: Use Behaviour of Malaysian School Teachers

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Abstract: Google Classroom (GC) has become a prominent online learning platform in Malaysia since the government's official announcement and later sees its boost in usage again during the COVID-19 pandemic due to the implementation of emergency remote teaching. The literature has unveiled that the mean score pertaining to technological knowledge in the context of GC usage was the lowest. Therefore, this study aims to investigate the level of GC use and the significant influence of facilitating conditions, habit, and behavioural intention on GC use behaviour among Malaysian teachers. A total of 37 secondary school teachers participated in an online quantitative survey consisting of 22 five-point Likert scale items. Descriptive statistics and standard regression analysis were used to analyse the data. Findings found that the extent of agreement and utilisation of GC during the pandemic were only moderate, requiring increased focus as a precautionary measure for potential future scenarios, such as another pandemic, where remote learning becomes the sole viable option. Results also suggested habit ($\beta = 1.128$, $p < .0005$) as the most significant factor that influences Malaysian teachers' GC use behaviour. Thus, future initiatives in boosting the intentions of using GC among Malaysian teachers need to be considered.

Keywords: Google Classroom, Use Behaviour, Secondary Teachers, Malaysiaii

1. Introduction

Before the outbreak of the pandemic, the Malaysian Ministry of Education (2019) officially announced the use of Google Classroom (GC) as the main online teaching platform for national schools. Subsequently, the outbreak of the pandemic has driven the implementation of emergency remote teaching, where teachers were obligated to fully adopt GC as their main medium of instructional delivery. It is undeniable that the application of e-learning has improved due to the outbreak of the pandemic (Hoque et al., 2020; Mokhtar, 2020). However, in the study by Zakaria et al. (2021), they indicated that educators recognise the benefits of Google Classroom as an effective online learning platform but obstacles arise due to limited knowledge and facilities making the integration of online learning through Google Classroom more difficult as compared to face-to-face teaching. A recent study by Piaralal et al. (2023) also revealed that the mean score for technological knowledge in relation to the use of GC was the lowest. Consequently, they concluded that teachers should prioritize upgrading their technological proficiency to effectively promote the intention to use Google Classroom (Piaralal et al., 2023).

The sudden shift from traditional face-to-face classrooms to the new norm of sole online teaching and learning indisputably created new challenges for educators around the globe, not to mention those from underrepresented countries where information and communication technology (ICT) growth is only at the emerging stage. Thus, this study focuses on three constructs, which are facilitating conditions, habit, and behavioural intention to investigate the GC use behaviour among teachers. These teachers as the actual

implementers of GC can reveal crucial information after the execution of the platform for more than two years. The key information on GC use from this study can add great significance to the existing body of knowledge regarding the use of GC in Malaysia.

1.1.1 Main research objective

Addressing the problems stated earlier, the main objective of this paper is to determine the level of agreement of the three constructs, the level of GC use behaviour and how much variance in GC use behaviour can be explained by facilitating conditions (FC), habit (HB), and behavioural intention (BI).

1.1.2 Specific research objectives

This paper thus sets out to achieve the following specific research objectives:
1. To determine the level of agreement on facilitating conditions, habit, behavioural intention of using GC among secondary school teachers.
2. To determine the level of GC use behaviour among secondary school teachers.
3. To investigate the influence of facilitating conditions on GC use behaviour among secondary school teachers.
4. To investigate the influence of habit on GC use behaviour among secondary school teachers.
5. To investigate the influence of behavioural intention on GC use behaviour among secondary school teachers.

1.1.3 Research questions

This paper aims to answer the following research questions:
1. What is the level of agreement on facilitating conditions, habit and behavioural intention of using GC among secondary school teachers?
2. What is the level of GC use behaviour among secondary school teachers?
3. Is there a significant influence of facilitating conditions on GC use behaviour among secondary school teachers?
4. Is there a significant influence of habit on GC use behaviour among secondary school teachers?
5. Is there a significant influence of behavioural intention on GC use behaviour among secondary school teachers?

1.1.4 Hypotheses

Aligned with the objectives of the study, the following hypotheses were proposed:
H1: There is a significant influence of facilitating conditions on GC use behaviour among secondary school teachers.
H2: There is a significant influence of habit on GC use behaviour among secondary school teachers.
H3: There is a significant influence of behavioural intention on GC use behaviour among secondary school teachers.

2. Literature Review

Generally, it has been found that past studies on educational technologies and online learning platforms like GC were often focusing on higher educational settings (Basher, 2017; Dash, 2019; Dewi et al., 2022; Kumar & Bervell, 2019; Mafa, 2018; Olumorin et al., 2022; Shaharanee et al., 2016). Besides, most of the past studies also focused on the effectiveness and impacts of these online learning platforms (Basher, 2017; Dash, 2019; Shaharanee, 2016), limited studies were found to focus on the actual use of GC and applications.

2.1 The utilisation of Google Classroom in Malaysia

Before GC was launched by Google Apps for Education in 2014 (Piaralal et al., 2023), the government introduced the Frog Virtual Learning Environment (VLE). Frog VLE is an online based system, offering various features such as uploading documents, videos, and chatroom for teachers to communicate with their students (Rahayu et al., 2019). Today, GC is a part of the Google Workspace for Education (formerly known as G Suite in Education). It is an application that is user-friendly that enhances teachers' work performance by fostering active learning during online teaching and learning (Ahmad et al., 2022). In addition, GC also allows teachers to share teaching resources such as pictures and videos effortlessly, besides distributing assignments, carrying out quizzes, and doing grading works online (Chung, 2022; Rosni et al., 2022). Following the discontinuation of the Frog Virtual Learning Environment, GC which offers a variety of benefits, further presents itself as a superior platform and has become a prominent platform to schools in Malaysia.

2.2 Common challenges encountered during online teaching and learning

Often in the process of online teaching and learning, poor Internet connectivity poses the main challenge to both educators and students (Cheok et al., 2017). Educators and students from rural areas were reported as facing more challenges compared to those in urban areas to conduct online teaching and learning (Nation, 2019). On the other hand, Cheok et al. (2017) and Lepp et al. (2021) mentioned that some teachers viewed lack of time as the major concern in the implementation of e-learning. The teachers claimed that the overload of work in school had restrained their intentions of exploring and learning the system further (Cheok et al., 2017). Teachers have expressed the need to be trained so as to overcome the challenges of using educational technology in online teaching and learning. The issue of inadequate ICT skills among teachers has also been highlighted by Nidup (2022) as one of the prominent barriers to teaching online. In fact, both Cheok et al. (2017) and Rauf and Swanto (2020) have indicated that without an appropriate training environment, access to the necessary technology, and support from relevant authorities, teachers would lack the self-confidence to successfully incorporate educational technologies within their classrooms.

In addition to this, Rauf and Swanto (2020) have highlighted that there are several other aspects that may affect their use of using educational technologies in online classroom teaching and learning. Therefore, this study sets out to investigate the level of GC use and the significant influence of facilitating conditions, habit, and behavioural intention on GC use behaviour among Malaysian teachers.

2.3 Theoretical and Conceptual Frameworks

This study adapted Venkatesh et al. (2012)'s Unified Theory of Acceptance and Use of Technology 2 (UTAUT 2) by narrowing the focus solely on the three constructs (facilitating conditions, habit and behavioural intention) that directly contribute to the use behavior of GC among teachers. Venkatesh et al. (2003) explained facilitating conditions were initially a core construct from the Model of PC Utilisation (MPCU) which was derived mainly from the theory of human behaviour. Facilitating conditions were defined as objective factors in the environment that observers agree which make an act easy to accomplish (Venkatesh et al., 2003). In this study, facilitating conditions is referred to the provision of support such as Internet connection, modern technology, technical assistants, computers, and laptops (Malaysian Ministry of Education, 2013) for Malaysian teachers to utilise GC during the pandemic.

On the other hand, habit was defined as the act of automatically performing behaviours because of the learning that has occurred (Venkatesh et al., 2012). Nikian et al. (2013) have also stated that teachers' repetitive use of technology would be a form of habitual routine in daily teachings. In this study, habit is referred to Malaysian teachers' routine use of GC automatically for online teaching and learning during the pandemic.

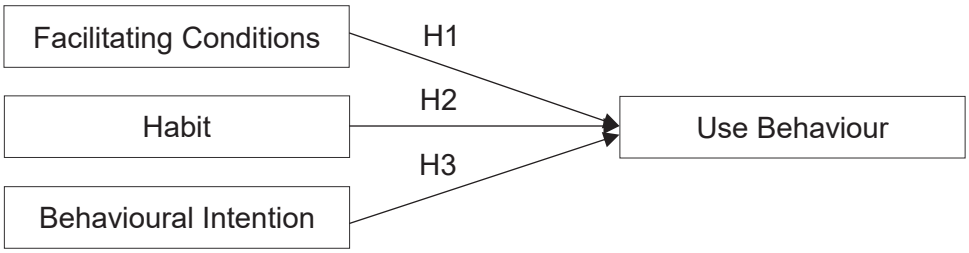

Figure 1. Conceptual framework of this study.

Behavioural intention to use was initially defined by Fishbein and Ajzen (1980) as the degree of likelihood that a person makes use of a certain technology or application. It has also been stated by Venkatesh et al. (2012) that behavioural intention plays a role as the key predictor of certain technology use. In this study, behavioural intention is referred to as whether Malaysian teachers intend to use GC in the future.

Finally, use behaviour has been referred to as the actual usage of a certain technology or application by Venkatesh et al. (2012). In this study, use behaviour is referred to as the consistency of using GC for online teaching and learning among Malaysian teachers during the pandemic. Consequently, with all the constructs and variables defined, the research framework of this study is depicted in Figure 1, along with the hypotheses that were proposed to align with the research objectives of the study.

3. Method

This study employed a quantitative approach to answer all the research questions of the study. An online questionnaire was used to gather the data needed in investigating the influence of facilitating conditions, habit, and behavioural intention on the use behaviour of GC among Malaysian teachers. Besides, the level of agreement on facilitating conditions, habit, behavioural intention of using GC among the teachers and the level of GC use behaviour among the teachers during the pandemic were also determined by using descriptive statistics (research questions 1 & 2). Multiple regression was employed as the inferential statistics method to address research questions 3, 4, and 5.

3.1 Research instrument, sampling, and data collection

In this study, an online survey tool known as Qualtrics was used to build and distribute the online questionnaire survey. The questionnaire consisted of two sections: Section A for the collection of respondents' demographic, while Section B comprised 22 items measuring the facilitating conditions, habit, behavioural intention, and use behaviour of GC respectively (https://tinyurl.com/ympr6tsx). Each item was measured on a five-point Likert scale.

As for the data collection, 56 responses were collected initially through Qualtrics. After the cleaning of data by removing partial responses and speeding responses, there was a total of only 37 responses which were valid for further analysis. As suggested by Maxwell (2000) and Statistics Solutions (2021, August 2), the rule of thumb for getting an adequate sample size is following the ratio of subjects to predictors be at least 10:1. Thus, the sample size of 37 subjects to three predictors (facilitating conditions, habit, and behavioural intention) of this study is sufficient to obtain valid and actual findings.

3.2 Reliability and validity of the instrument

The Cronbach's Alpha test was used to access the reliability of the questionnaire used to collect data for this study. As depicted in Table 1, the Cronbach's Alpha values for all the variables ranged from .783 to .974, which were considered ideal as all of them were more than .7 (Taber, 2018), proving that the instrument used in this study had an ideal internal

consistency and reliable. In addition, a panel of two experts in the field of Malaysian educational technology have also reviewed the questionnaire to ensure its content validity.

Table 1. *Reliability statistics of the predictor variables and dependent variable*

Variable	Cronbach's Alpha	Cronbach's Alpha based on Standardized Items	Number of Items
Facilitating conditions	.783	.778	5
Habit	.944	.945	5
Behavioural Intention	.971	.972	5
Use Behaviour	.974	.975	7

4. Results and Findings

4.1 Demographic information

In this study, there were 11 males (29.73%) and 26 females (70.27%). Figure 2 depicts the age distribution of the respondents, the mean score obtained is 36.30 and the mode is 26 with the standard deviation of 9.70. Moreover, 13 teachers had more than 15 years of teaching experience, followed by 9 teachers with 1 to 5 years of teaching experience, 6 teachers with 11 to 14 years of teaching experience, 5 teachers with 4 to 10 years, and only 4 teachers had less than a year of teaching experience.

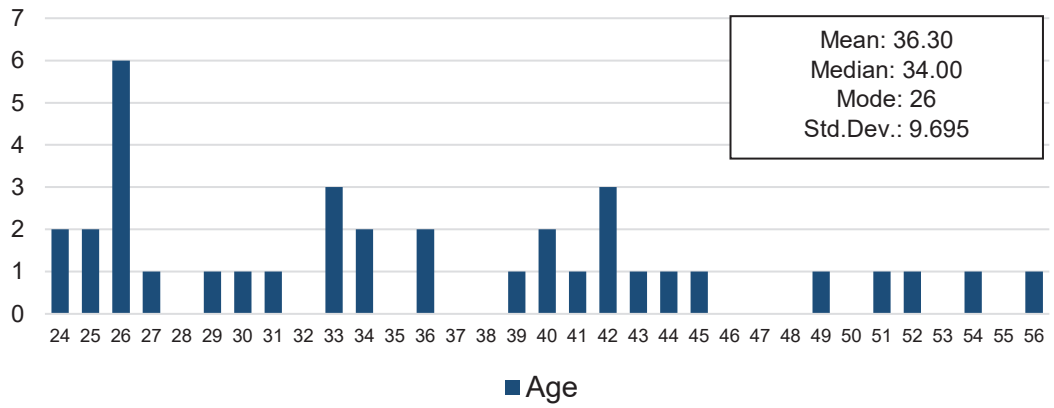

Figure 2. Age distribution of the respondents.

4.2 Findings on the level of agreement for each variable

Table 2. *Indication of level by categorization of mean scores*

Category of Scores	Level
Below 2.33	Low
Between 2.33 and 3.66	Moderate
Above 3.66	High

Table 3. *Level of agreement on FC, HT, BI and level of Google Classroom use behaviour*

Variable	Number of Items	Mean of Items	Level
Facilitating conditions	5	3.492	Moderate Agreement
Habit	5	3.259	Moderate Agreement
Behavioural Intention	5	3.400	Moderate Agreement
Use Behaviour	7	3.459	Moderate Use

The scale to indicate the level of agreement with the items according to their respective means was adapted from Moses et al. (2010). The level of agreement of the variables was quantified on five different levels using a five-point Likert scale, ranging from “Strongly disagree”, “Disagree”, “Neither agree nor disagree”, “Agree” and “Strongly agree”. The items in each independent variable ranged from “Strongly disagree” – 1 point to “Strongly agree” – 5 points. The data collected is equally clustered into three levels of agreement namely low agreement, moderate agreement, and high agreement as presented in Table 2. From the findings, all the variables showed a moderate level of agreement (Table 3) as their means were between 2.33 and 3.66. “Facilitating conditions” has the highest mean which is 3.492; the lowest mean score is “habit” with a mean of 3.259.

Meanwhile, the level of GC use behaviour was quantified on five levels ranging from “Never”, “Sometimes”, “Occasionally”, “Most of the time” and “Always”. The data gathered showed a moderate level of use as the mean was 3.459, also between 2.33 and 3.66.

4.3 Findings from the standard multiple regression

Standard multiple regression was performed to determine if the predictor variables (facilitating conditions, habit, and behavioural intention) have had an influence over the use behaviour among teachers during the pandemic. The following section reports the multiple regression findings, particularly on the model summary, Analysis of Variance (ANOVA), coefficients, and normal p-p plot as suggested by Hinton et al. (2014) as these are sufficient in reporting multiple regression reports.

As shown in Table 4, the R-value was reported as .868 while the R2 was at .753. When interpreting the findings from the model summary, R2 is often referred to as it explains the extent of variance that occurred among the variables being investigated (Hinton et al., 2014). In this case, as the R2 was reported as .753, it meant that 75.3% of the variance that occurs among variables can be significantly explained. The ANOVA table on the other hand, as depicted in Table 5, has successfully reported the occurrence of the three predictor variables, facilitating conditions, habit, and behavioural intention as existent when using GC. This was proven to be true as the df value was reported at three in the regression and these are significant at $p < .0005$.

Table 4. *Model Summary*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.868a	.753	.730	.71041

Notes. a. Predictors: (Constant), Mean_BI, Mean_FC, Mean_HB
b. Dependent Variable: Mean_UB

Table 5. *Analysis of Variance (ANOVA)*

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	50.739	3	16.913	33.512	.000b
	Residual	16.654	33	.505		
	Total	67.393	36			

Notes. a. Dependent Variable: Mean_UB
b. Predictors: (Constant), Mean_BI, Mean_FC, Mean_HB

However, in the coefficients as shown in Table 6, two interesting findings were obtained. When reporting the coefficients, Wagner (2015) has stated that unstandardized coefficients are referred to explain the effects of predictor variables on dependent variables. In the coefficients table at unstandardized coefficients, prominently habit has the highest beta value (1.393), which meant that for every occurrence of habit, the use behaviour increases by 1.393. Contrary to habit, the beta value (β) for behavioural intention was found to be at negative, as it was reported as -.397, which indicated that for every occurrence of behavioural intention, the use behaviour declines by .397. As for the facilitating conditions, although β is recorded at .090, the p-value is .605 which is not significant.

Table 6. *Coefficients*

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		β	Std. Error	β		
1	(Constant)	-.044	.511		-.086	.932
	Mean_FC	.090	.172	.056	.522	.605
	Mean_HB	1.393	.229	1.128	6.085	.000
	Mean_BI	-.397	.225	-.343	-1.766	.087

Notes. a. Dependent Variable: Mean_UB

Drawing the results from multiple regression, the research hypotheses, H1 and H3 were not supported as both facilitating conditions and behavioural intention have no significant influence on the GC use behaviour among the teachers during the pandemic. Meanwhile, only the second research hypothesis, H2 is supported, and it is proven that habit significantly influenced the use behaviour of GC among the teachers during the pandemic.

Table 7. *Summary of results*

Hypothesis	Description	P-value	Result
H1	Facilitating conditions → Use Behaviour	.605	Not Supported
H2	Habit → Use Behaviour	.000*	Supported
H3	Behavioural Intention → Use Behaviour	.087	Not Supported

Notes. *$p < .05$

5. Discussion and conclusion

Descriptive statistics reveal that all three levels of agreement on each variable, with facilitating conditions, habit, and behavioural intention respectively, have mean values between 2.33 and 3.66, which is at a moderate level. Given that GC has only been fully utilised since the eruption of the pandemic, such a moderate level of agreement and use behaviour points out that there might be a need in providing training to teachers. This is supported by the statement of Cheok et al. (2017) that teachers have expressed the need to be trained to overcome the challenges of using educational technology for online teaching and learning.

Based on the findings, it was found that facilitating conditions and behavioural intention did not significantly influence the GC use behaviour among secondary school teachers. This can be attributed to several reasons why these two independent variables have an insignificant influence on GC usage. In this study, facilitation conditions refer to the provision of support such as Internet connection, modern technology, technical assistants, computers, and laptops provided to support the use of GC. If the teachers lacked access to reliable internet connections, technical support, or appropriate devices, it could have definitely hindered their capability to effectively use GC for their lessons. In addition to that, inadequate professional development opportunities related to GC could also lead to a lack of facilitating conditions or support among the teachers to successfully implement GC in their teaching and learning. Therefore, the facilitating conditions did not significantly influence the use behaviour of GC could be due to the lack of facilitating conditions that were available to the teachers, as they were working from their respective homes during the pandemic.

As for behavioural intention, it refers to whether Malaysian teachers plan to use GC in their teaching practices in the future. It can also be said as the teachers' willingness to adopt and utilise GC in their lessons but if the teachers are resistant to change or if they did not perceive the benefits of using GC, their behavioural intention to use GC might be low. Some teachers could have concerns about the effectiveness of using GC in achieving teaching objectives and students' learning outcomes. Another reason could be due to the preference that the teachers have for traditional teaching methods compared to online teaching and learning could also negatively influence their behavioural intention to utilise GC. These could

be some of the reasons that influenced the teachers' decision to not fully embrace or use GC for teaching and learning purposes.

On the other hand, this research has shown that the use of GC in classrooms during the pandemic may have potentially become a normalised routine among teachers due to the significance of habit found in the study, which subsequently indicates that it has become a habitual routine among the teachers. Not only that, teachers were compelled to utilise GC as it served as the sole platform or method available to establish connectivity with students to conduct their lessons during the outbreak of the pandemic. Yet, even though the utilisation of GC in classrooms was mandatory, it does not necessarily imply that all teachers are equally proficient or knowledgeable in using the platform (Zakaria et al., 2021; Piaralal et al., 2023).

Venkatesh et al. (2003) have previously emphasized that only when facilitating conditions, habit, and behavioural intention occur, a person would be most likely to use certain technology in the given setting. Narrowing these findings to the Malaysian context, it is thus arguable for teachers who lack facilitating support, who are reluctant to routinized GC as part of their lessons or who show less likelihood of using GC. This could possibly cause the GC use behaviour of teachers consequently to be lesser.

To summarize, among all the predictor variables, the habit was the best predictor of the use behaviour of GC among the Malaysian. In addition, there may be other factors that have influenced the use behaviour of GC as shown by the variance, R2, as the three constructs only explained 75.3% of the GC use behaviour among the teachers, there was 24.7% variance that was not explained. It could be other potential variables which were not included in this study that have affected the GC use behaviour among the teachers.

As part of the Malaysian Ministry of Education's (2013) aspiration to provide quality education to students across the nation, when teachers display disinclination in embracing educational technology within classrooms, it not only hinders their ability to achieve the ministry's goals but also prevents Malaysia from maintaining its educational standards in the global context. Hence, the findings from this study found that the extent of utilisation of GC during the pandemic was not fully embraced which requires increased focus as a precautionary measure for potential future scenarios, such as another pandemic, where remote learning becomes the sole viable option.

6. Implications of the study

This study has shown a number of pertinent aspects of the actual usage of GC among Malaysian teachers. One of the most prominent findings is that Malaysian teachers do not have positive intentions in the continuous usage of GC. However, they were using GC mostly due to their habitual routine as a part of their regular teaching practice. This is further supported by Awang et al. (2019) who stated that proper planning and implementation would lessen challenges, thereby alleviating teachers' resistance toward GC. It is believed that with continuous support from teachers, administrators, and the relevant government agencies to enhance the quality of online teaching and learning experiences, the initiatives of achieving the aspiration of Education 4.0 will be accomplished in the near future (Hoque et al., 2020; Nikian et al., 2013). The Malaysian Education Blueprint 2013-2025 has stated that a total of 10,000 public primary and secondary schools in Malaysia will be provided with 4G Internet connectivity and a Virtual Learning Environment (VLE) system to boost the quality of educational ICT innovation (Malaysian Ministry of Education, 2013). Further, the Malaysian Ministry of Education (2013) has also stated that an environment where teachers are constantly trained on using ICT would create a learning environment that has high quality and brings great impact on the overall learning achievements. The findings of this study can be considered for the planning of future initiatives in boosting the uptake intentions of e-learning among teachers in Malaysia.

7. Limitations and recommendations

This study, however, may be biased as the data collection was gathered only from the Malaysian secondary school teachers' point of view. In addition, merely employing a quantitative method may be inadequate in delivering generalizable and comprehensive data that truthfully describes the scenario being examined. Future studies should employ a more rigorous research method, include qualitative methods to enrich the quality of research by generating rich, interpretive findings from the teachers on the use of educational technology during the pandemic, and also recruit a larger sample size to improve the overall reliability of the findings.

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