

The Student's Acceptance of Google Classroom in Co-Curricular Photography Course Using Technology Acceptance Model (Tam)

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Abstract:- The study investigates the factors that affect the acceptance of Google Classroom (GC) in the photography courses of Politeknik Sultan Haji Ahmad Shah (POLISAS) students. The framework of the study is based on Technology Acceptance Model (TAM). The study seeks to find out whether there is a significant relationship between 1) perceived ease of use (PEOU) and perceived usefulness (PU) of using GC. 2) Perceived ease of use (PEOU) with behavioral intention (BI) to use GC? And 3) perceived usefulness (PU) with behavioral intention (BI) to use GC? The population is 35 students enrolled in the photography course in June 2019, in which GC is used as a teaching and learning (TnL) tool. A total of 29 samples were drawn based on simple random sampling. Partial least square structural equation modeling (PLS-SEM) was used to determine the hypothesis model. Cronbach's alpha coefficient (CA) and Composite Reliability (CR) are used to determine the internal consistency reliability with a value of >0.8. The factor loading is >0.5 with a range of 0.701 to 0.939 for convergent validity (CV). The discriminant validity (DV) for the HTMT is met with the value of the constructs <1. The results show that there is a significant relationship between PEOU and PU for the use of GC, PEOU has a positive influence on BI for the use of GC by the POLISAS photography club students and there is no significant relationship between PU and BI for the use of GC. The study shows that further efforts and improvement should be made on students' attitude and behavior in using new TnL methods.

Keywords:- Component; Google Classroom, Technology Acceptance Model, E-Learning.

I. INTRODUCTION

The role of educators is challenging and needs to be aligned with educational technology to prepare them for Fourth Industrial Revolution (IR4). Students are exposed to a digital world where the Internet, cloud computing, mobile apps, and social media are an important medium for the formal education system. The rapid development of technology and covid pandemic requires a paradigm shift among educators in adapting new teaching methods to empower students in their cognitive skills and attitudes.

Rapid changes in TnL methods are forcing educators to find educational tools that fulfill IR4 needs. GC is one of the TnL tools that correspond to a new technology that combines the Internet, cloud computing, and social media. Kasey Bell (2015) defines GC as a free application designed to help students and teachers communicate, collaborate, organize, and manage assignments, go paperless, and more. Vangie Beal (2019) defines GC as a free collaboration tool for teachers and students. Teachers can set up an online classroom, invite students to the class, and then create and distribute assignments. Within GC, students and teachers can have conversations about assignments, and teachers can track student progress. According to this definition, GC is one of the e-learning (eL) and m-learning (mL) TnL methods which can be used both in the classroom and outside the classroom. The study by Shital P. B. and Pankaj B.D. (2010) shows that eL includes all forms of online instruction using personal computers - learning. According to Lan and She' (2012), mL is defined as a learning model that enables students to acquire learning materials anytime and anywhere using mobile technology. According to Parsons (2014), mL is a part of e-Learning.

II. PROBLEM STATEMENT

Rapid technological change is forcing educators to improve their skills and teaching methods to learn how to use technology and develop appropriate tools that are useful and easy to use for both educators and learners. Educators need to learn new technologies to support students and enhance their learning in a new environment. Technology-based instruction provides students with the opportunity to learn and practice in a visual and virtual environment (Bonk, 2011; Davidson & Goldberg, 2009). With technology available in the classroom, more educational institutions are integrating technology into their curriculum.

GC is one of the current technologies used as a TnL tool. GC is very useful and easy to use in the online classroom, but the question is whether GC can be accepted and whether it is useful and easy to use based on students' perception.

A. Research Objective

The objective of this study is to investigate the factors that influence the acceptance of GC in students' photography courses on POLISAS.

B. Research Questions

This study aims to answer the following research questions:

Is there a significant relationship between:

- perceived ease of use (PEOU) and perceived usefulness (PU) of using GC?
- perceived ease of use (PEOU) with behavioral intention (BI) to use GC?
- the perceived usefulness (PU) with the behavioral intention (BI) to use GC?

C. Research Hypothesis

Three (3) hypotheses are required to answer the research questions.

- **H1:** Perceived ease of use has a positive influence on perceived usefulness of using GC (PEOU→ PU).
- **H2:** Perceived ease of use has a positive influence on behavioral intention to use GC (PEOU→BI).
- **H3:** Perceived usefulness has a positive influence on the behavioral intention to use GC (PU→BI).

III. LITERATURE REVIEW

A. Introduction

GC is one of the educational technologies that is easy and useful for students and instructors and can be used both in the classroom and outside the classroom, but not all new technologies can be accepted by students. TAM was introduced by Davis in 1986 and is a model for measuring technology acceptance. Davis (1986) developed and validated new measurement scales for PU and PEOU, two different variables believed to determine computer use. The new scales were found to have strong psychometric properties and significant empirical relationships with self-reported measures of usage behavior. In addition, several new insights were gained into the nature of PU and PEOU and their role as determinants of user acceptance.

Most researchers concluded that GC is the best tool for TnL. The study by Kgalemelo R.M. (2018) proved that GC is the best tool for TnL and the results showed that learning and acquiring skills and knowledge through GC is preferable.

B. PEOU and PU

Keith R. H. and Joanne Y. (2018) found that students appreciate that GC facilitates access to all the materials needed for the course as all the information they need can be found in one place and they can submit assignments as well as contribute to the discussion through this medium. Students also feel that the use of GC has positively changed the nature of the class. The learning environment became more comfortable as they were able to interact dynamically with the lesson content, but also more focused on the learning experience and the ability to use the learning tool anytime, anywhere, and not just in the classroom is beneficial.

Izwan Nizal M.S. (2016) found that students strongly agreed with all components of the GC in terms of easy access to course materials, sending and receiving assignments, navigating the system, and ease of understanding. In this study, it was also found that students strongly agreed with the factor PU i.e., the quality of TnL activities was excellent such as submitting an assignment, assistance in investigating problems, evaluating new ideas and applying what they have learned, useful feedback from the instructor, grading system in GC which helps in monitoring their performance and understanding the current topic.

Venkatesh and Davis (1996), revealed that users base their PEOU on computer self-efficacy (SE) before hands-on system use, irrespective of the extent of procedural information given to them. They also found that the determinant of PEOU is only after a direct experience with the system.

The PEOU has a significant relationship between PU of GC usages based on past studies.

C. BI

Student's BI to use GC depends on other variables such as SE, PEOU of GC. A few studies stated that SE, PEOU and PU have a significant relationship with BI to use GC.

Park, S. Y. [11], perform a study and the result shows that both SE and subjective norm plays an important role in affecting attitude towards eL and BI to use eL. Rana A. and Mostafa (2018) proved that PU and PEOU as crucial features of GC. The students who rely on GC will be able to use it as a new gadget in TnL activities.

D. Research Framework (RF)

RF theory is based on the TAM by Venkatesh & Davis [4]. Figure 1 shows the adapted model which proposes that PEOU and PU of technology are predictors of user BI using the technology and actual usage. In TAM, PU refers to the degree to which the user believes that using the technology will improve their work performance, while PEOU refers to how effortless users perceive using the technology will be. Both factors influence the user's BI to use technology. Figure 2 is the RF for this study which is a reduced TAM model. This framework excludes the external variables and actual system use because this study would like to direct examine PU and PEOU to BI to use GC.

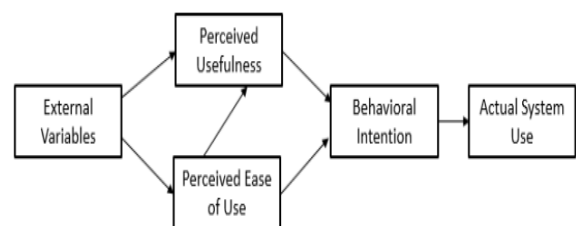


Fig. 1. Final model for TAM (Venkatesh & Davis, 1996)

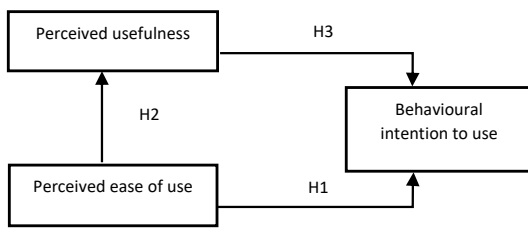


Fig. 2. The Research framework (A technology usage framework for Google Classroom)

IV. METHODOLOGY

A. Research Design

This research was designed based on action research because Sagor R. (2004), defined action research as a tool used to help educators uncover strategies to improve teaching practices. The study has four (4) phases as shown in figure 3.

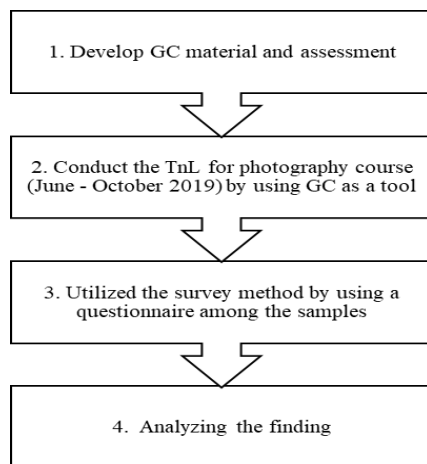


Fig. 3. Phases in the Research Design

B. Population and Sample

The population is the students enrolled in the photography course in Session June 2019 POLISAS where the course is taught using GC as a tool. Simple random sampling was used to select the sample. The total sample consists of 29 students from 35 populations. The total sample was calculated using Sample Size Calculator of The Survey System version 10.5 (2019). The researcher used a confidence level of 95%.

C. Research Instrument and Data Analysis

The questionnaire was developed as an instrument for this research and was divided into two (2) sections. The first section contained questions on demographics and the second section was divided into three (3) variables which are PU, PEOU and BI on GC usage. The questionnaires were adopted from Rana A.S A.M (2018) and Izwan Nizal M.S et.al (2016). An online questionnaire distributed to the respondents through a Google form.

V. DATA COLLECTION AND ANALYSIS

DEMOGRAPHIC, KNOWLEDGE, AND EXPERIENCE IN GC

Table 1 shows the demographic, knowledge, and experience in GC of the respondents. The females constitute 82.8% and 17.2% for males from the collected data. Related to GC experience and usage, the result showed that 72.4% of the respondents have heard of GC before joining the Photography course and 27.6% never heard about GC. Most of the respondents are 1st-time users of GC in TnL with the percentage of 62.1 %, 6.9% have used 2 times in TnL and 31% have used 3 times. Furthermore, results indicated that 72.4% have used 1 semester GC in TnL, 3.5% have to use GC 2 semesters in Tnl and 24.1% have used more than 2 semesters.

TABLE I. DEMOGRAPHIC, KNOWLEDGE, AND EXPERIENCE IN GC

Attributes	Sub-groups	Percentage (%)
Gender	Male	17.2
	Female	82.8
Have heard of GC	Yes	72.4
	No	27.6
Have applied for GC in a course	1 course	62.1
	2 course	6.9
	3 course	31
	None	0
Applied duration of GC	1 Semester	72.4
	2 Semester	3.5
	More than 2 semester	24.1

A. Reliability and Validity

From the data collection of the sample, Cronbach's Alpha Coefficient and Composite Reliability were used to determine the internal consistency reliability. According to J. F. Hair et.al (2014), the measure of reliability ranges from 0 to 1, with values of .60 to .70 as the lower limit of acceptability. As shown in Table 2, the Cronbach's alpha values for each construct are greater than .9. According to Nunnally, J.C [13],

in the application domains where important decisions are made regarding specific test scores, a reliability of .90 is the minimum that should be tolerated. The composite reliability from Table 2 shows a value greater than 0.9 for each construct. According to Bagozzi R. P. and Yi Y. (1988), the Composite Reliability must be greater than 0.6. Thus, the internal consistency reliability is accepted for the data collections and is in accordance with the recommendation for item reliability.

Convergent validity and discriminant validity are two fundamental aspects of construct validity in CFA. Convergent validity occurs when different items are used to measure the same construct and the scores of the different items are highly correlated. To ensure convergent validity, all factor loadings should be significant and greater than 0.5 (J. F. Hair et.al 2014). As shown in Table 3, the Factor Loading of the study is greater than 0.5 with a range of 0.701 to 0.939 and the AVE scores for each construct are greater than 0.5.

TABLE II. : INTERNAL CONSISTENCY RELIABILITY OF MEASUREMENT MODEL.

Constructs	Cronbach's Alpha	Composite Reliability
	(>0.7)	(>0.7)
PU	0.95	0.969
PEOU	0.91	0.935
BI	0.93	0.957

To examine the discriminant validity, cross-loading, and Heterotrait-Monotrait Ratio (HTMT) were examined. Based on Table 4, discriminant validity for HTMT is met with the value of constructs is less than 1. The discriminant validity is confirmed if the value does not have a value of 1 on any constructs (J. Henseler et. al 2015).

TABLE III. CONVERGENT VALIDITY OF MEASUREMENT MODEL

Constructs	Items Code	Items	Factor Loadings (>0.5)	P-Value (P< 0.005)	AVE (>0.5)
<i>BI</i>	<i>BI1</i>	I intend to increase the use of the Google Classroom if being used in the course	0.919	0.002	0.818
	<i>BI2</i>	It is worth recommending the Google Classroom for other students	0.865	0.000	
	<i>BI3</i>	I'm interested to use the Google Classroom more frequently in the future	0.901	0.000	
	<i>BI4</i>	I hope that lecturers are using the Google Classroom more frequently in the future	0.930	0.000	
	<i>BI5</i>	I am ready to use Google Classroom if it is being used by lecturers in a course	0.903	0.000	
<i>PEOU</i>	<i>PE1</i>	Google Classroom is convenient and user-friendly	0.863	0.000	0.743
	<i>PE2</i>	Google Classroom requires no training	0.701	0.000	
	<i>PE3</i>	Google Classroom enables me to access the course material	0.939	0.000	
	<i>PE4</i>	Google Classroom is easy to use	0.928	0.000	
	<i>PE5</i>	Google Classroom allows me to submit my assignments	0.858	0.000	
<i>PU</i>	<i>PU1</i>	Google Classroom helps me to understand the current topic discussed	0.908	0.000	0.838
	<i>PU2</i>	Google classroom help me to submit an assignment on time	0.909	0.001	
	<i>PU3</i>	The grading system in Google classroom help in monitoring my performance	0.920	0.000	
	<i>PU4</i>	The quality of learning activity by using Google classroom was excellent	0.910	0.000	
	<i>PU5</i>	Google Classroom enables me to accomplish tasks more quickly	0.932	0.000	
	<i>PU6</i>	Google Classroom enhances my learning productivity	0.912	0.000	

Referring to the value of discriminant validity cross-loading as shown in Table 5, the discriminant validity is met because the loading of each indicator is higher than the loadings of its corresponding constructs' indicator.

TABLE IV. DISCRIMINANT VALIDITY – HTMT

	PEOU	BI	PU
PEOU	-	-	-
BI	0.975	-	-
PU	0.95	0.879	-

TABLE V. HYPOTHESIS TEST RESULTS

Hypothesis	Relationship	Beta	SE	T Value	P Values	LL	UL	Decision
H1	PEOU → BI	0.782	0.278	2.815	0.005	0.003	1.123	Supported
H2	PEOU → PU	0.897	0.105	8.582	0	0.603	0.967	Supported
H3	PU → BI	0.142	0.252	0.563	0.574	-0.226	0.693	Unsupported

B. Relationship Analysis

Figure 4 and Table 6 demonstrates the path coefficients and p-value for each hypothesis. It shows that only two hypotheses are supported, and one hypothesis is unsupported. The hypothesis test is supported based on three conditions which are i) direction and beta value will show the direction either positive or negative, ii) T-Value must be higher than 1.645, significant at 0.05, or 2.33; significant at 0.01 and iii) Lower level (LL) and Upper Level (UL), there should not have 0 in the between (Ramayah et al., 2018).

TABLE VI. INTERPRETATION R CORRELATION, COHEN 1988

r, correlation	Level
0.10 – < 0.30	Small
0.30 – < 0.50	Medium
≥ 0.50	Large

TABLE VII. DISCRIMINANT VALIDITY CROSS LOADING

Items Code	PEOU	BI	PU
BI1	0.827	0.919	0.768
BI2	0.882	0.865	0.843
BI3	0.82	0.901	0.771
BI4	0.79	0.93	0.724
BI5	0.779	0.903	0.673
PE1	0.863	0.85	0.83
PE2	0.701	0.621	0.546
PE3	0.939	0.861	0.789
PE4	0.928	0.869	0.861
PE5	0.858	0.793	0.798
PU1	0.856	0.832	0.908
PU2	0.857	0.791	0.909
PU3	0.744	0.737	0.92
PU4	0.816	0.813	0.91
PU5	0.846	0.751	0.932
PU6	0.795	0.696	0.912

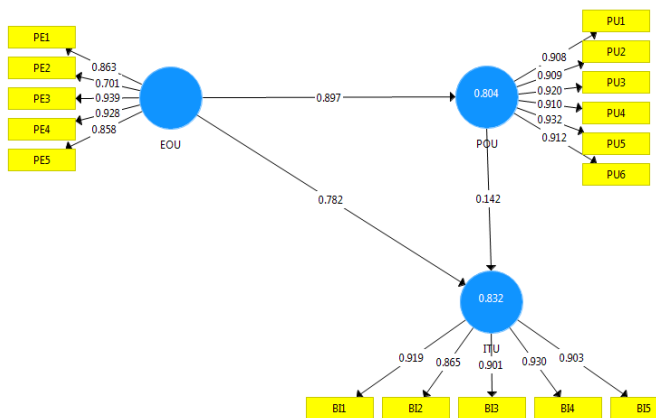


Fig 4

From table 6, the results show that positive directions are PEOU → BI, beta= 0.782, t= 2.815, LL = -0.003, UL= 1.123. PEOU → PU, beta=0.897, t= 8.582, LL =-0.603, UL= 0.967. Hence, H1 and H2 are supported, and it is concluded that PEOU has a positive relationship with the Intention to Use Google classroom, and PEOU also has a positive relationship with PU towards Google classroom. Meanwhile, PU (H3) does not have a positive relationship with the Intention to Use Google classroom.

H1 (β= 0.782, P<0.05) describes the relationship between PEOU and BI, this indicates that perceived ease of use of enhancing the behavioural intention to use Google Classroom. H2 (β= 0.897, P<0.05) describes the relationship between PEOU and PU, this reveal that PEOU influence the PU of GC H3 (β= 0.142, P>0.05), describes the relationship between PU and BI. The result shows that perceived usefulness cannot influence the student behavioural intention to use Google Classroom. Data interpreted based on Cohen (1988), the interpretation is shown in table 7.

VI. RESULTS AND DISCUSSION

A. 1st research question: *Is there a significant relationship between PEOU with PU of GC usage?*

The study showed that there is a significant relationship between PEOU with PU of GC usage. There is a large effect size for the relationship between PEOU and PU with a correlation \geq of 0.50 (Cohen 1988).

B. 2nd research question: *Is there a significant relationship between PEOU with BI to use GC usage?*

The result revealed that PEOU positively affects BI students' photography club in POLISAS to use GC. Students have a positive impact on the PEOU of GC. There is a large effect size for the relationship between PEOU and BI with a correlation \geq of 0.50 (Cohen 1988).

C. 3rd research question: *Is there a significant relationship between PU with BI to use GC usage?*

This result indicates that there is no significant relationship between PU with BI to use GC usage. Even students' PU in using GC but the BI to use GC is low. There is a small effect size for the relationship PEOU and BI with correlation $<$ 0.30 and close to 0.1 (Cohen 1988).

VII. CONCLUSION

This study is to evaluate the student acceptance of GC in Co-Curricular Photography Course using TAM. The outcomes revealed that the chosen sample of students' photography club in POLISAS had proved that not all the factors have a significant relation to the BI to use GC. This study emphasizes the PU and PEOU as crucial factors of GC to be used as an alternative teaching method. The PU factor does not significantly affect the chosen sample of students' intention to use GC. However, the PEOU factor has a significant relationship with BI for students to use GC, but Davis (1989) found that users had a significantly greater correlation with user behaviour than the ease of use. The possible reason incurred because of a lack of Computer Self-Efficacy (CSE) among respondents. Based on the study by Mohd Shoki M.A et.al (2012), found that CSE gave a stronger influence than PU and PE on respondents' BI to use the technology given. The importance of these results to any decision-makers in academic institutions is the fact that the students who rely on GC technology will be able to use it as a new gadget for leveraging their educational system. The decision-makers of the higher educational institutions should acknowledge the factors of GC and build their infrastructure based on the result achieved in this study. To implement this technology practically, the higher educational institutions should provide the students with training opportunities so that students' abilities to discover the comprehensive and effective features of GC will be more apparent and implemented widely by the end-users. Due to this fact, this study has a few limitations. The limitations of this study could be summarized as follows: (1) not all the factor from TAM is used, further research should focus on other factors in TAM such as CSE that may influence the acceptance of GC. (2) the data was collected from POLISAS Co-Curricular Photography Course students, so the results did not represent all the polytechnics in

Malaysia. Therefore, further research is required to collect data from other polytechnics in Malaysia to increase the generalizability of the results. (3) the data collection was constrained on students only. Future research should involve the lecturer to understand the factors that affect GC acceptance from the lecturer view.

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