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Determinants of Google Workspace Usage and Collaborative Learning among University Students in Selangor

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Abstract

Technology for education can assist students' learning goals while opening new avenues for critical thinking, communication, collaboration, and creativity. One of the platforms used by students is Google Workspace, a cloud-based productivity suite developed by Google. However, the problem of insufficient support for sharing content and the unethical use of information system services has become a major concern highlighted in this study. The quantitative findings in this study show a correlation between the usage of Google Workspace and the Collaborative Learning Environment and a recommendation to upskill students with digital literacy skills and ethics of information use.

Keywords: Information Management, Educational Technology, Collaborative Learning

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1.0 Introduction

Technology for education can assist students' learning goals while opening new avenues for critical thinking, communication, collaboration, and creativity Ahmad and Lidadun (2017). These resources are free, ad-free, reliable, and safe. Numerous millions of kids use them already all around the world. Technology use in education such as online collaborator tools (Microsoft Teams), Cloud-based learning software (Graphy), and Digital Whiteboards (Whiteboard. chat). All this digital hub that brings meetings, content, and apps together in one place. Educators can create collaborative classrooms, connect in professional learning communities, and communicate with school staff.

Despite the advantages of using technology in education, there needs to be more support for integrating and sharing content, although one of the most well-known and widely used online collaboration platforms for document creation is Google Docs. It provides a platform for the real-time exchange of content as well as the collaborative development of content, both of which are necessary for design activities that focus on problem-solving. However, it does not offer any video or audio communication channels, meaning that participants cannot see or hear each other and cannot carry on verbal conversations.

Furthermore, unethical use of information systems services, related to activities such as hacking, software piracy, phishing, and spoofing, has become a significant security concern for individuals, organizations, and society in terms of the threat to information

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systems (IS) security. Akil et al. (2021) found that this happened associated with individual behaviour and attitude. Chatterjee defines unethical information technology use (UITU) as "the violation of privacy, property, accuracy, and access of any individual, group, or organization by any other individual, group, or organization. Due to the escalating use of information technology within the academic sphere, there is a heightened imperative to examine the ethical perspectives of learners and educators within social situations.

The integrated Science, Technology, Engineering and Mathematics (STEM) education paradigm, characterized by collaborative efforts among instructors in the areas of planning, teaching, and assessment, fosters the establishment of shared student learning standards across several topic domains, hence yielding a favorable impact on student performance (Wells, 2019). Students benefit from an integrative approach because it allows them to use their knowledge and skills, promotes the development of blended disciplinary perspectives, enhances the breadth and depth of their learning, encourages a growth mindset, and gives them more time to explore the curriculum fully. One of the widely used search engines is Google, which has given people more control over their lives and altered how we acquire information in a way that ten years ago would have been unimaginable. People use Google daily. Without Google, life as we know it now would be unlivable for most people, especially younger generations. The attractiveness of Google spans beyond national boundaries and cultural contexts. Word-of-mouth rather than high-profile advertising is responsible for the search engine's unprecedented level of popularity and known as Google Workspace.

Google Workspace, formerly known as G-suite, is a cloud-based productivity suite developed by Google that allows small businesses and individuals to streamline their work. Because Google Workspace is accessible via the web, users do not need to worry about downloading, installing, or updating any software. It is a new invention for people living in today's world, particularly during this epidemic, to enable internet users to finish their work easily and with no difficulty while working online. Therefore, Google Workspace deserves the acclaim they are currently receiving for being the platform that is utilized the most in 2019. Google Workspace platforms provide capabilities that are suitable for usage in professional projects and workflows Anwar et al. (2021). These platforms are tools centered on working remotely together on projects. According to Asyiqin et al. (2022), Google Workspace unifies communication and collaboration centred on the generation of content for the distant environment of COVID-19 and beyond. Therefore, the main objective of this paper is to examine the correlation between perceived playfulness towards a collaborative learning environment and the interestingness of content towards a collaborative learning environment among university students.

2.0 Literature Review

The university is crucial in preparing the next generation of engaged educators and citizens whose skills and perspectives will shape the world. The goals of higher education are constantly (re)evaluating and adjusting in response to societal shifts and challenges brought on by technological advances; these factors also help shape shifts in students' worldviews. Education for sustainability has many potential goals in the classroom and requires students to develop not only their minds (through critical analysis, foresight, and metacognition), but also their hearts and souls (via emotional maturity and moral compass) because, arguably, higher education is the final stage in a person's development (Atoy, el al., 2020).

According to Google, adopting the Google Workspace for Education Tools can make a difference in the quality of education received in the classroom. By utilizing instructional tools that are more approachable, it may be possible to improve both communication and cooperation. Its purpose is to boost overall output. The technologies help save time for both teachers and students by centralizing the processes of producing, storing, sharing, and assessing content. These simple educational aids enable students to do their best work possible. Google Workspace for Education is an excellent solution for schools to use to protect their data since it uses proactive security features and controls to preserve students' work, IDs, and personal information (Ahmad & Lidadun, 2017).

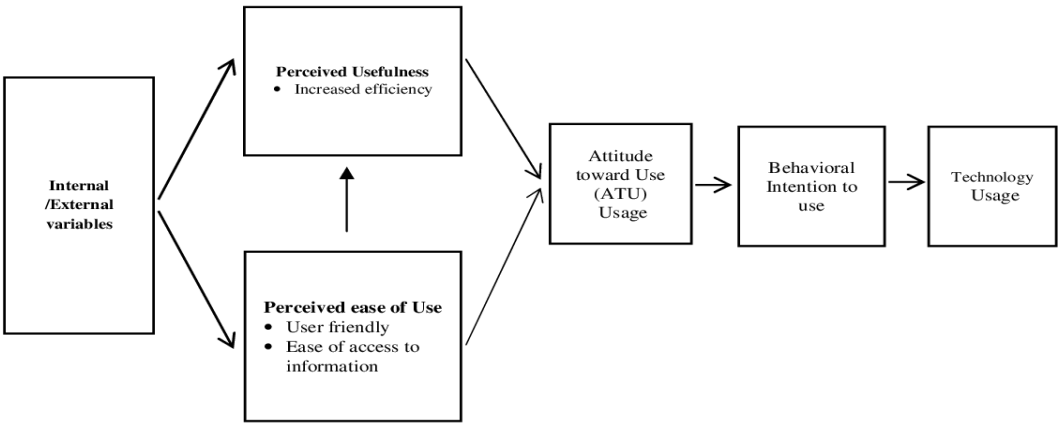

Fig. 1: Technology Acceptance Model (Davis, 1989)

Based on Figure 1, The Technology Acceptance Model (Davis, 1989), commonly referred to as TAM, proposes that the acceptance of an information systems theory, which aims to explain how users adopt and utilize a technology system, is contingent upon two key factors: the perceived usefulness and the perceived ease of use. The primary characteristic of this paradigm is in its prioritization of the

impressions held by the prospective user. In the context of technology products, it is important to note that the perception of usefulness and user-friendliness is subjective and contingent upon the views held by potential users. Consequently, the mere conviction of the product's developer regarding its utility and ease of use does not guarantee its acceptance among the target audience. When first conceived, the Technology Acceptance Model set out to "explain the determinants of computer acceptance that is general, capable of explaining user behaviour across a broad range of end-user computing technologies and user populations, while at the same time being both parsimonious and theoretically justified" [Davis et al., 1989, p. 985]. Since then, the TAM has been applied to a wide range of non-computing technologies, such as telemedicine (Aucott, 2022), educational technology (Azhar, 2018), mobile applications (Balkaya & Akkucuk, 2021), and online education (Blasco et al., 2020).

Based on Figure 2 below, the integrative learning approach known as "cooperative learning" aims to provide students with the social skills and leadership experiences they need to succeed in the modern world. Social interdependence theory is the theoretical foundation for cooperative learning. Individual learning outcomes are contingent on both the learner and their environment. Cooperative learning expands on this idea by presuming that people learn more effectively when working together. Cooperative learning encompasses a broader scope than mere group work, extending beyond mere collaboration to incorporate many pedagogical strategies and structures that foster active engagement and meaningful interaction among students. The acquisition of academic knowledge and skills is facilitated by the use of social and interpersonal abilities by students in order to attain their educational objectives. Cooperative learning is a frequently employed instructional approach in diverse practical contexts such as service learning, integrative internships, and continuing education (CE) seminars. Students are granted academic recognition in certain educational environments while actively addressing real-world issues. As a collective, the students engage in mutual learning and exhibit a higher likelihood of successfully accomplishing the academic task.

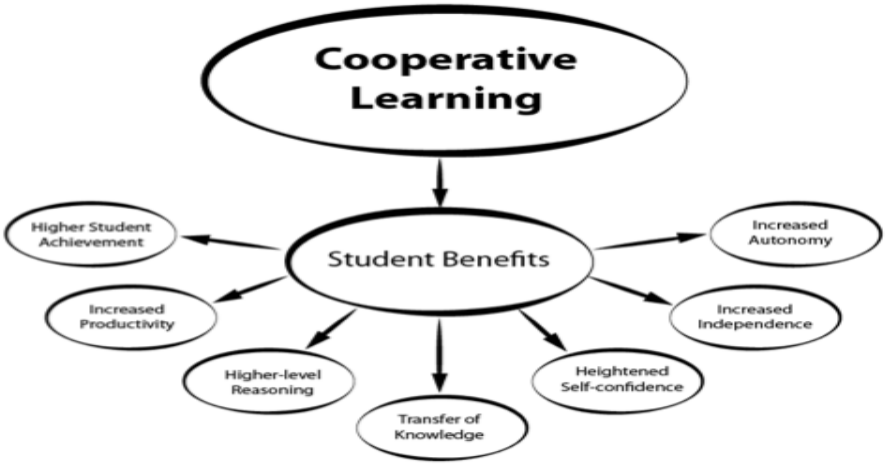

Fig. 2: Mathew Levit, 2018

3.0 Methodology

As a result of the fact that this study did not make any attempt to investigate and comprehend the meaning that individuals or groups have in relation to their usage of Google Workspace, it is not appropriate to categorize this study as belonging to the qualitative camp. On the basis of this premise, the researcher would position himself under the positivism paradigm and subscribe to the quantitative approach. The population of this study will consist of students from one selected public university in Selangor. The students were chosen because the nature of their learning process requires them to engage with Google Workspace. In the learning process, they will rely on the Google Workspace tools for collaboration on assignments, submissions, or educational activities among lecturers and classmates.

The sampling technique used Probability sampling, commonly referred to as random sampling, is a sampling method that ensures each element within the population has an equal opportunity to be included in the sample. In the context of a raffle draw, where individual units are selected from a larger group through a process that is not intentionally biased, this occurrence represents a purely random event that determines whether unique items or more items are favoured (Diamantopoulos & Siguaw, 2006). Therefore, after careful consideration, the main objective of this paper is to examine the correlation between perceived playfulness towards a collaborative learning environment and the interestingness of content towards a collaborative learning environment.

4.0 Findings

This research used a quantitative method, and the questionnaire was distributed using a Google form. The following hypotheses were established for this study:

H1: There is a significant correlation between perceived playfulness and a collaborative learning environment.

H2: There is a significant correlation between the interestingness of content and the collaborative learning environment.

4.1 Demographic Profile

Table 1 below present the frequency and percentage of the respondent for this study. Of the 191 respondents, 35.6% were male, and 64.4% arewere female. Hence, most students are female, with a frequency of 123 respondents and male, with a frequency of 68 respondents.

Table 1. Gender, age, and educational level

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Gender					
Valid	Male	68	35.6	35.6	35.6
	Female	123	64.4	64.4	100.0
	Total	191	100.0	100.0	
Age					
Valid	19-21 years	67	35.1	35.1	35.1
	22-24 years	94	49.2	49.2	84.3
	25-27 years	22	11.5	11.5	95.8
	28 and above	8	4.2	4.2	100.0
	Total	191	100.0	100.0	
Education Level					
Valid	Bachelor Degree	176	92.1	92.1	92.1
	Master Degree	13	6.8	6.8	99.0
	Doctoral Degree	2	1.0	1.0	100.0
	Total	191	100.0	100.0	

Table 1 also shows the highest number of ages between 22 - 24 were, 49.2%, equivalent to 94 respondents, whereas 19 - 21 were 35.1%, equivalent to 67 respondents. Moreover, the age between 25 - 27 received 22 respondents with 11.5%, but the number aged 28 and above was 4.2%, equivalent to 8 respondents with the least number. The table also shows the majority of the student's education level, which is from Bachelor's Degree, which has 92.1%, equivalent to 176 frequencies. Next is the Master's Degree, which has 6.8%, which is equivalent to 13 frequencies where, whereas 1.0% is from the Doctoral Degree with two frequencies.

4.2 Respondents Knowledge of Google Workspace

Table 2 below shows the respondent's familiarity with the terms Google Workspace, which mostly answered Yes, with 96.3% with 184 frequencies. Meanwhile, 3.7% answered no with seven frequencies.

Table 2. Respondents' knowledge about Google Workspace

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
Do you know about Google Workspace?					
Valid	Yes	184	96.3	96.3	96.3
	No	7	3.7	3.7	100.0
	Total	191	100.0	100.0	
Have you heard about Google Workspace services?					
Valid	Yes	181	94.8	94.8	94.8
	No	10	5.2	5.2	100.0
	Total	191	100.0	100.0	
How did you know about Google Workspace?					
Valid	Advertisement	40	20.9	20.9	20.9
	Social Media	50	26.2	26.2	47.1
	People Around	50	26.2	26.2	73.3
	Self-Explore	41	21.5	21.5	94.8

	Training Programme	9	4.7	4.7	99.5
	Others	1	0.5	0.5	100.0
	Total	191	100.0	100.0	
Have you used Google Workspace before this?					
Valid	Yes	180	94.2	94.2	94.2
	No	11	5.8	5.8	100.0
	Total	191	100.0	100.0	

The table also shows that the majority is yes for the term of Google Workspace services, which is 94.8%, equivalent to 181 frequency, and 5.2% for no, which frequency is 10. Based on the table, the majority know Google Workspace from social media and People Around which is 26.2% equivalent to 50 frequencies where, as 21.5% for Self-Explore which frequency is 41; 20.9% for Advertisement which frequency is 40; 4.7% from Training Programme which frequency is nine and the least is 0.5% that stated others which frequency is 1. Finally, the table shows that the majority is yes for the experience using Google Workspace, which is 94.2%, equivalent to 180 frequencies where, whereas 5.8% for no, which frequency is 11.

4.3 Frequency of using Google Workspace

Table 3 below shows that the majority of respondents is Often using Google Workspace which is 37.7%, equivalent to 72 frequencies; occasionally use Google Workspace, which is 31.9%, equivalent to 61 frequencies; frequently use Google Workspace, which is 22.5%, equivalent to 43 frequencies, seldom using Google Workspace which is 6.8% that equivalent to 13 frequencies whereas the least is 1% for rarely using Google Workspace which frequency is 2.

Table 3. Frequency of using Google Workspace

		Frequency	Percentage	Valid Percentage	Cumulative Percentage
How often did you use Google Workspace?					
Valid	Rarely	2	1.0	1.0	1.0
	Seldom	13	6.8	6.8	7.9
	Occasionally	61	31.9	31.9	39.8
	Often	72	37.7	37.7	77.5
	Frequently	43	22.5	22.5	100.0
	Total	191	100.0	100.0	
What is the purpose of Google Workspace?					
Valid	Entertainment	11	5.8	5.8	5.8
	Social Network	10	5.2	5.2	11.0
	Education	87	45.5	45.5	56.5
	Work Purpose	63	33.0	33.0	89.5
	Team Collaboration	30	10.5	10.5	100.0
	Total	191	100.0	100.0	
Where did you learn to use Google Workspace?					
Valid	Google Cloud Training	17	8.9	8.9	8.9
	Colleagues	141	73.8	73.8	82.7
	Paid Course	5	2.6	2.6	85.3
	Organization Programme	28	14.7	14.7	100.0
	Total	191	100.0	100.0	

Table 3 also shows that the majority of purposes of using Google Workspace is for Education which is 45.5%, equivalent to 87 frequencies, for work purposes is 33% which is equivalent to 63 frequencies; for team collaboration, 10.5% which is equivalent to 20 frequencies, for the entertainment is 5.8% which is equivalent to 11 frequencies and for the social network purpose is 5.2% which is equivalent to 10 frequencies. Lastly, the table shows that the majority of respondents learn using Google Workspace through colleagues

which is 73.8%, equivalent to 141 frequencies; next is through organization programmes that have 14.7%, which is equivalent to 28 frequencies; for the team, collaboration is 10.5% which is equivalent to 20 frequencies, through Google cloud training is 8.9% which is equivalent to 17 frequencies and through the paid course is 2.6% which is equivalent to 5 frequencies.

4.4 Descriptive Analysis

Table 4 shows the present study's mean and standard deviations for each variable. Respondents were asked to indicate their opinion on perceived playfulness, interestingness, Content and collaborative learning environment as measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Collaborative learning environment recorded the highest mean score of 4.402 out of 5.0 points with a standard deviation of 0.353. Perceived playfulness and interesting content recorded mean scores of 4.384 and 4.397 out of 5.0 points, with standard deviations of 0.411 and 0.384, respectively.

Table 4. Descriptive analysis of constructs

Constructs	Mean	Standard Deviation
Perceived Playfulness	4.384	0.411
Interestingness Content	4.397	0.384
Collaborative Learning Environment	4.402	0.353

4.5 Measurement Model Assessment

Table 5 shows the results of the assessment of the measurement model. Factor loading, composite reliability (CR) and average extracted variance (AVE) were used as criteria for assessing the measurement model. The indicator loading for indicator reliability was suggested at 0.708 or higher (Ramayah et al., 2018). However, loading levels that are > 0.7 (Hair et al., 2017), 0.6 and 0.5 (Byrne, 2016) and 0.4 (Ziyae, 2016) are adequate if the AVE and CR are complemented by other items that have high scores of loadings. The CR and AVE benchmarks are 0.7 and 0.5, respectively. The results shown in Table 6 suggest that all of these criteria are met, thus suggesting that the converging validity of the measurement model can be presumed. Figure 3 shows the SmartPLS output of the measurement model.

Table 5. Factor loading, composite reliability and average variance extracted

Items	Factor Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)
Collaborative_Learning_Environment_2	0.563	0.748	0.538
Collaborative_Learning_Environment_3	0.703		
Collaborative_Learning_Environment_4	0.740		
Collaborative_Learning_Environment_5	0.498		
Collaborative_Learning_Environment_7	0.670		
Collaborative_Learning_Environment_8	0.756		
Interestingness_Content_1	0.619	0.737	0.511
Interestingness_Content_2	0.671		
Interestingness_Content_3	0.524		
Interestingness_Content_4	0.495		
Interestingness_Content_5	0.791		
Interestingness_Content_6	0.698		
Perceived_Playfulness_1	0.561	0.762	0.541
Perceived_Playfulness_2	0.695		
Perceived_Playfulness_3	0.634		
Perceived_Playfulness_4	0.703		
Perceived_Playfulness_5	0.726		
Perceived_Playfulness_6	0.653		

Table 6. HTMT assessment of discriminant validity

	Collaborative Learning Environment	Interestingness Content	Perceived Playfulness
Collaborative Learning Environment			
Interestingness Content	0.771		
Perceived Playfulness	0.739	0.726	

Subsequently, the discriminant validity of the model was assessed using the Heterotrait-Monotrait ratio of correlations (HTMT), as suggested by Hair et al. (2014). In this study, all of the HTMT values of each construct range fulfil the recommended criterion values of 0.90 (Gold et al., 2015) and 0.85 (Kline, 2015), thus indicating that discriminant validity has been ascertained. As seen in Table 13, each of these requirements was met; hence, the discriminatory validity of the measurement model can be claimed.

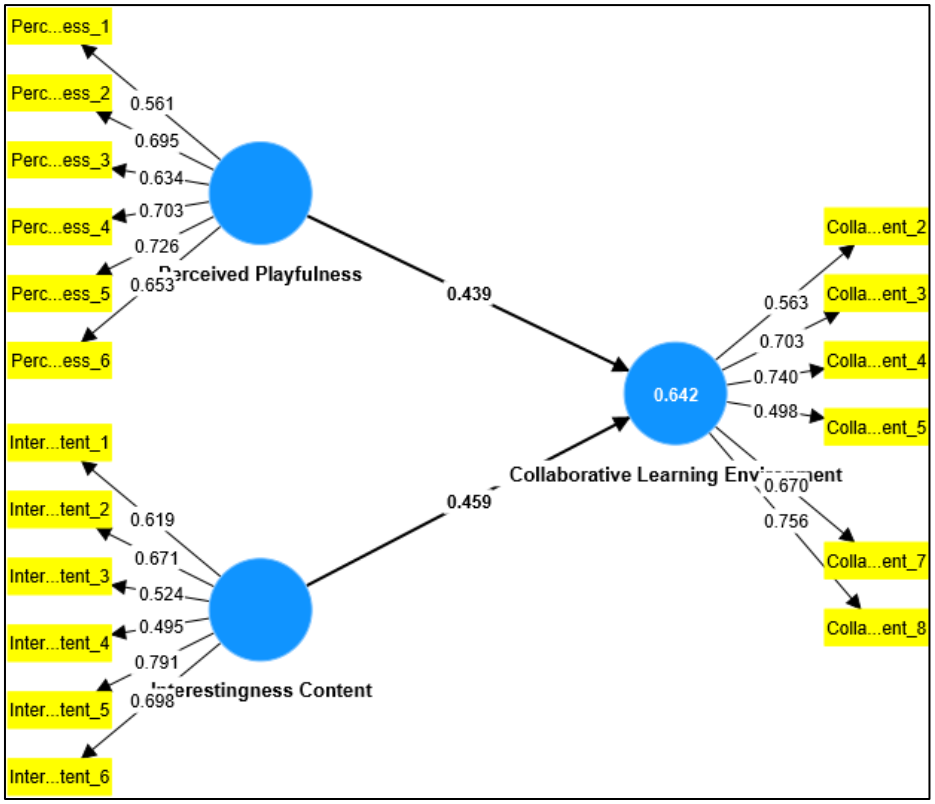

Fig. 3: SmartPLS output of the measurement model

4.6 Structural Model Assessment

Table 7 exhibits the results of the path analysis, VIF, f2, R2, and Q2 for perceived playfulness, collaborative learning environment, and interestingness of content and collaborative learning environment. The Variance Inflation Factor (VIF) was evaluated to determine if there is a multicollinearity issue in the model, and the parameter must be at a suggested value of VIF < 5.0 (Hair et al., 2014) or VIF < 3.3 (Diamantopoulos & Siguaw, 2006). The result of this procedure showed that the model does not have the problem of multicollinearity, as all VIF values are well below 3.3. The rule used to interpret the results is to support the hypothesis when $p < 0.001$ ($t > 1.645$), $p < 0.05$ ($t > 1.96$), or $p < 0.001$ ($t > 2.58$). The results demonstrated that all hypotheses are supported. The next step in assessing the significance and relevance of the structural model relationship was to assess the level of R2. Cohen (1988) recommended a different interpretation of R2, where 0.26, 0.13, and 0.02, respectively, are described as substantial, moderate and weak. The value of R2 in this study is 0.639, implying that the estimated model is substantial.

Table 7. Result of path analysis, VIF, f2, R2 and Q2

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Values	P Values	VIF	f^2	R^2	Q^2
H1: Perceived Playfulness -> Collaborative Learning Environment	0.439	0.430	0.086	5.084	0.000	1.540	0.350	0.639	0.610
H2: Interestingness of Content -> Collaborative Learning Environment	0.459	0.476	0.086	5.365	0.000	1.540	0.382		

The blindfolding procedure used the D = 7 distance omission to analyse predictive relevance. The predictive relevance of Q2 for a Collaborative Learning Environment is 0.610. As the Q2 value is above zero, it can be concluded that the model has predictive relevance based on the Collaborative Learning Environment (endogenous construct). Meanwhile, it is recommended by Ramayah et al. (2018) to assess the level of effect size (f2) using the effect size proposed by Cohen (1988). The objective of the (f2) assessment is to identify the effect size of predator constructs on an endogenous construct (Cohen, 1988; Ramayah et al., 2018). Cohen (1988) claims the

recommended (f2) values are 0.35, 0.15 and 0.02, interpreted as large, medium and small in terms of effect size. As shown in Table 7, the results prove that the effect is significant for all relationships.

5.0 Discussion

Digital literacy concentrates on the understanding and competency of young people required to use technology critically and effectively (Dintoe, 2018). Also, communicating impeccably through technology in education is a part of digital literacy. Thus, this study has shown that the active usage of technology education, such as Google Workspace in a university setting, enables students to become successful in collaborative learning. From the findings, it is concluded that usage of Google Workspace tools is essential in helping the collaborative learning environment. This is because the Google Workspace tools could be one of the services that are recommended for use in any organization, including individuals. The use of Google Workspace services can be evidence as this will allow a digital footprint for any document and collaboration in team learning. More industries are dependent on non-traditional electronic communication platforms (Docrat, 2022). This shows that faculty members are required to be able to adapt to the transformation and assist students in preparing for future communication expectations. From Table 7 above, both hypotheses show a significant relationship with T values above the threshold of 1.645 (H1: 5.084, H2:5.365). According to Fedewa (2020), users' subjective assessments of their playfulness are reflected in the focus, pleasure, and exploration that make up their "perceived playfulness". When implementing new technologies in educational settings, such as using Google Workspace, perceived playfulness is a crucial aspect that significantly impacts students' attitudes and behavioural intentions. The interestingness of content is also crucial as the aspect of the ability to evaluate, for example, the degree to which the content of an image or a video is attractive, has a few direct applications, ranging from the retrieval of content for personal and professional use, and storytelling of content, to selective encoding, and even to education (Hussaini et al., 2020).

6.0 Conclusion and Recommendations

The acquisition of digital literacy skills is of utmost importance in augmenting the educational achievements of students in the contemporary era of digital technology. Specifically, this program provides students with the essential abilities to proficiently utilize and traverse digital tools, resources, and information. Moreover, acquiring digital literacy skills enables students to engage proficiently in collaborative and effective communication within digital contexts. This proficiency empowers them to actively participate in online debates, exchange ideas, and cooperatively undertake group projects. Next, embedded Digital Literacy Skills in the curriculum as technology education can be utilized optimally to improve student learning outcomes. The primary justification for including design and technology education in the curriculum is to provide students with the necessary skills and knowledge to engage actively with the ever-evolving technological landscape of the future. The limitation of the research is that only quantitative approaches were used in the study for data gathering and analysis with selected University students. The research aims to upskill students with digital literacy skills and ethics of information use to improve their quality of life and upgrade information systems services. Hence, it can give policymakers guidelines on producing a quality education, especially for embedded digital literacy skills in the university curriculum. It is hoped that students fully utilize Google Workspace as it is convenient and user-friendly; however, they need to equip themselves with digital literacy skills, especially to use it ethically and responsibly.

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