

Exploring the Role of PU and PEOU with the Delone and McLean Factors Towards Google Classroom Satisfaction Amidst Covid-19 Among Higher Education

Geralyn L. Amistad¹, Jonalyn C. Naduma¹, Maria Joycel B. Cabe¹,
Nerie Jane S. Patawaran¹, and Ronie S. Halili²

Abstract

It has been a widely used and recognized tool because of its convenience and ease of use, the Google Classroom. It appears to be recognizable whether the student is satisfied with these technological tools that easily assess their learning. Objectives: The main purpose of this paper is to determine the factors influencing satisfaction with Google Classroom. The TAM factors and D&M ISS factors were used to design an online questionnaire survey distributed to college and university students around Pampanga. A total of 259 responses were analyzed with SMARTPLS 3. The result shows that the two model factors are related and have a significant relationship. It also shows that perceived usefulness and ease of use is a determinant that affects the result of D&M ISS factors to be significant with Google Classroom Satisfaction. It also indicated that all factors were ≤ 0.00 , and P-value ≤ 0.05 were achieved, significantly indicating that students are satisfied with Google Classroom, leading to continuously using it.

Keywords: Google Classroom, Technology Acceptance Model, DeLone and McLean Information System Success Model, Satisfaction, Pandemic

Introduction

As the COVID-19 outbreak continuously happens, many institutions adapt different technological tools to continue the learning process of COVID-19. The significance of technology supports and helps educators accommodate large groups of students with different styles (Coppola et al., 2021). Various technological tools in education assist various institutions and teachers to continue learning despite pandemics, and Google Classroom is one of the most used tools. Beal (2021) claimed that Google Classroom is an educational application that is free to use as a collaborative instrument between students and teachers. Using Google Classroom, the teacher should create a classroom and invite the students by sending the link or manually inputting their email addresses. In line with this, the students and teachers can

communicate about the content and instruction of certain activities.

Moreover, Google Classroom is associated with different Google apps, such as Google Drive, which stores files; Gmail to email each other; YouTube, and other platforms that provide dynamic information that enriches the environment (Bondarenko et al., 2018). The teachers used this application to make students study independently, but still with their guidance. Therefore, Google Classroom is one of the Google applications used in education that enables students and teachers to work productively and collaborate (Sudarsana et al., 2019).

The usefulness and accessibility of Google Classroom enable many institutions to continue education despite the COVID-19 outbreak.

¹Bachelor of Technical-Vocational Teacher Education, Institute of Education, Arts and Sciences

²Faculty Member, Institute of Education, Arts and Sciences

Google Classroom is a free application from Google that accommodates the needs and enhances the productivity of students in this kind of situation. Beaumont (2018) confirmed that Google Classroom is flexible as it is easy to use and allows students, teachers, and users to do collaborative work with ease. In line with this, Google Classroom is functional to use, with a limited effort to support learning. Therefore, the ongoing use of Google Classroom by many institutions enables researchers to conduct a study that investigates factors that influence student satisfaction with Google Classroom.

Hypothetical Framework

The study's Hypothesis is stated as follows:

Ohliati and Abbas (2019) state that the insignificant result of communication quality does not affect students' satisfaction. The quality of communication will have an impact on social presence. Interactivity influences communication quality (Sulisworo et al., 2020). Communication tools are more important than ease of use and efficiency because they are also quite effective. Google Classroom is cloud-based, which enables students not to lose their assignments (Bielefeld, 2016). The quality of communication between instructors and students makes teaching efficacy one of the critical factors in educational facility settings (Olufunke, 2020). Therefore, the study hypothesized that:

H1. Communication Quality significantly influences Google Classroom Satisfaction.

Almarashdeh (2016) claimed that information quality has a minimal impact on student learning since the substance of information depends on the teacher's credibility and content standard. In addition, the sufficiency of the data is one of the factors that may affect the quality of information. In line with this, Google Classroom's communication quality benefits teacher use. However, because of technical issues, it is difficult for students to access it because of a poor connection and the availability of an

internet connection while in school (Okmawati, 2020). Furthermore, using Google Classroom, information and communication were linked since information may contribute to communication by ensuring the privacy of student-teacher conversations (Abuzant et al., 2021). Therefore, the study hypothesized that:

H2. Information Quality Influences Communication Quality.

Teachers and students accept the new Learning Management System/E-learning because of its ease of access, and it can substitute the conventional learning method (Alhumaid et al., 2020). Ease of use and student friendliness are the main aspects to consider while evaluating system quality. The overall excellence of a system is affected by its ease of use and usefulness (Bakhri, 2020). In addition, students notice Google Classroom's features of accessibility, ease of use, and task accomplishing (Wijaya, 2016). It is also simple to use and makes students complete coursework, quizzes, and projects online (Oktaria & Rahmayadevi, 2021). Therefore, the study hypothesized that:

H3. Google Classroom Ease of Use may influence Service Quality.

The degree to which a person feels it improves work performance refers to perceived usefulness, whereas information quality refers to the quality of data produced. Saputri (2020) states that Google Classroom is useful for independent activities but lacks elements that facilitate group discussions. Compared to other variables, Google Classroom is insignificant in providing a quality learning activity and grading system; yet some respondents believed these components are beneficial (Mohd Shaharane et al., 2016). In addition, students find Google Classroom difficult because of its accessibility, which allows students to utilize the learning platform involuntarily to cope with the current educational environment (Olufunke, 2020). Furthermore,

students complement Google Classroom's usefulness and information system features as they are easy to understand (Abuzant et al., 2021). Therefore, the study hypothesized that:

H4. Perceived Usefulness significantly impacts Information Quality.

The ease of using Google Classroom enables students to identify the usefulness of utilizing the platform in the classroom. Wijaya (2016) states that users can feel the ease and comfort of using Google Classroom to assist the students in completing activities and communicating with the instructor. Using Google Classroom increases students' efficiency, productivity, time management, and ability to accomplish tasks quickly (Khairani et al., 2020). When the user feels the application's usefulness, it becomes easier for them to use it and be functional. The students' states of mind towards Google Classroom were positive regarding its value, ease of utilization, and availability (Al-Emran & Malik, 2016). Ghofur (2018) concluded that Google Classroom could be substituted in inquiry-based learning to increase students' participation. Therefore, the study hypothesized that:

H5. Perceived Usefulness significantly impacts Perceived Ease of Use.

Google Classroom allows students to upload activities on time and connect with the class anytime and anywhere. Students prefer the quality of traditional education compared to Google Classroom (Putra, 2020). The system's performance refers to how well the data framework's equipment, program, arrangements, and procedures can provide data on customer demands (Salim et al., 2021). In addition, the quality of system performance is often the focus of system quality. Rahmawati (2020) claims that Google Classroom is simple to use since everything is practical and its features are simple to comprehend for its usefulness because it

employs signs that the user is already familiar with, such as sending an easy job because the sign is the same as sending an email. Therefore, the study hypothesized that:

H6. Perceived Usefulness influences System Quality.

Service quality is the degree to which a service measures how effectively a service is provided to individuals' expectations, while system quality is about the system features. The system has no significant effect on students' learning because the students are more concerned about the service quality of the institution than the program (Uddin et al., 2018). Service quality is the assistance provided and received by the user from the organization of information systems and personnel under IT support (Abuzant et al., 2021). The use of Google Classroom can simplify and speed up the teaching and learning process, which gives comfort to students. Service quality has a beneficial effect on the intensity of using Google Classroom and user happiness (Sari et al., 2021). In addition, Google Classroom gives an update and notice about the program to eliminate errors for better users. Therefore, the study hypothesized that:

H7. Service Quality has influence on System Quality.

A system quality is a collection of measurements used to evaluate some feature of a system's value. According to the platform's usability study, Google Classroom is exceptionally beneficial in terms of its understandability, attractiveness, and operability (Ventayen et al., 2018). In addition, students may believe that it is simpler to complete homework in Google Classroom since they may readily look for material in other web-technology systems (Tamin & Mohammad, 2020). Students in tertiary education appreciated the options provided by Google Classroom and Google Suit because they found these systems simple to understand and use, and they could

speak and contribute ideas online, fostering engagement and a feeling of community learning (Heggart et al., 2018). Google Classroom might serve as a safe documents storage system for both professors and students. Even after the semester has ended, access to uploaded learning materials, resources, and submitted documents is still available (Zuniga-Tonio, 2021). Therefore, the study hypothesized that:

H8. System Quality has influence on Google Classroom Satisfaction.

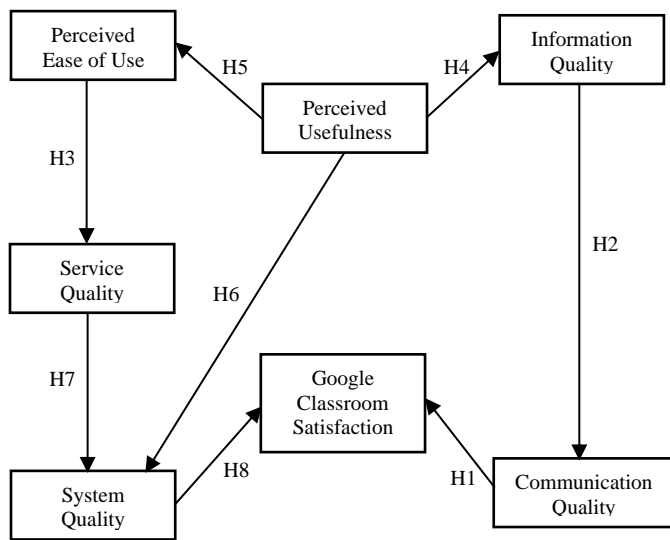


Figure 1. Hypothetical Framework

Therefore, this chapter concluded the different supporting articles, literature, and framework that will be divided into various parts of the chapter that will be the basis to strengthen the research structure and design. The next chapter will be the research methodology that will discuss the research method, instrument, and data analysis.

Method

The study uses a quantitative research method to collect essential information and data to investigate factors influencing Google Classroom satisfaction among higher education students. The research method is based on the

objectives and needs of the research. The quantitative method involves collecting numerical data through polls, questionnaires, and surveys. Bhandari (2021) stated that the quantitative method makes the results through the broad population by finding averages, testing causal relationships, and making predictions. In addition, quantitative research is the opposite method of qualitative research which collects and analyzes data in a non-numerical way, which indicates that no numbers are involved. Furthermore, quantitative research data depends on the observations and measurements that examine the questions about the sample population (Allen, 2017).

Research Instrument

The instrument enables programs to collect relevant data linked to a study topic to measure the intended outcome (Davis, 2021). A survey questionnaire was utilized to acquire responses from the participants regarding the research questions. The National Business Research Institute (2017) stated that online questionnaires are the most cost-effective approach to contacting the largest number of individuals worldwide. In addition, the online questionnaires had a greater response rate than postal questionnaires or in-person interviews because producers of online questionnaires must ensure anonymity and confidentiality. Bhat (2021), web-based or online questionnaires are one of the most widely used and trusted methods of conducting internet-based or online research.

In this study, a validated and improved questionnaire made from Google Forms was utilized to collect relevant data from college and university students in Pampanga. The study used Google Forms to conduct an online survey as a research instrument to acquire respondents easily and for safety purposes due to the pandemic. The CCA’s Dean of IEAS, Academic Coordinator of BTVTED, and Research Advisor, Dr. Ayodele Solomon organized and checked the research items. The instrument was also validated by

experts with the degree of Doctoral from Imo State University Owerri in the Department of Architecture Faculty of Environmental Science, by college instructors from Holy Angel University, the Department of Geography at Kwarrafa University Wukari, and by Associate Professors from De La Salle University and Vice-President of Research from City College of Angeles. The researcher's redesigned the items based on the validators' comments, which cover five items each related to the questions: Perceived Usefulness, Perceived Ease of Use, Information quality, System quality, Service quality, Communication quality, and Google Classroom Satisfaction.

Participants

The study participants were college and university students in Pampanga who are currently using Google Classroom for online learning since the pandemic. All year levels, from the 4th year to the 1st year, were invited to take part in answering the survey questionnaire. In line with this, the universities and colleges that participated in this study are from school 1, school 2, school 3, school 4, school 5, school 6, school 7, school 8, school 9, school 10, school 11, and school 12.

The participants were selected as respondents because they are the relevant individuals to the scope of the study that has been using Google Classroom since the pandemic up until the present. Validators also suggest participants to take students that are using Google Classroom to have better responses.

Adopted Analytical Tools

The researcher used SmartPLS 3 to determine the validity and significance of the seven factors that affect Google Classroom satisfaction. SmartPLS is a downloadable software that can be used for free in a 30-day trial. SmartPLS3 is useful for calculating, generating, and validating scientific management models (Sander & Lee, 2015). In addition, SmartPLS provides the route model,

which may define the link between variables and indicators. It also provides researchers with colorful graphics that they can use to create a beautiful model.

Furthermore, these are crucial in creating a comprehensible image and supporting the outcomes (Sander & Lee, 2015). In this study, the combination of two models, which are the TAM and the D&M ISS model, was validated by SmartPLS. Therefore, the analytical tool employed is SmartPLS, which is efficient, valid, and suitable for this research.

Results

Demographic Details

In this study, Table 1 shows the demographic information of the study participants. Prove that 49.03% of the respondents are from 4th year students, 24.32% are from 3rd year students, 6.18% are from 2nd year students, and 10.46% are from 1st year students. It also shows the university and college that has the majority of respondents, which are from the City College of Angeles (CCA) with a total of 64.09%, followed by Don Honorio Ventura State University (DHVSU) with a total of 23.17%, next is the Pampanga State Agricultural University (PSAU) with a total of 5.41%, while the Republic Central Colleges (RCC), Systems Plus College Foundation (SPCF), and Holy Angel University have a total of 1.54%. The least number of respondents are from the St. Nicholas College of Business and Technology (SNC) with a total number of 0.77%, followed by Global Knowledge Academy (GKA), Mabalacat City College (MCC), STI-College Angeles (STI), Angeles University Foundation (AUF) and Jocson College (JC) with a total number of 0.39%.

Table 1. Demographic Details

Factors	Categories	Frequency	Percentage (%)
Year	1 st year	53	20.46
	2 nd year	16	6.18
	3 rd year	63	24.32
	4 th year	127	49.03
	Total:	259	100
University and Colleges	CCA	166	64.09
	DHVSU	60	23.17
	PSAU	14	5.41
	RCC	4	1.54
	SPCF	4	1.54
	HAU	4	1.54
	SNC	2	0.77
	GKA	1	0.39
	MCC	1	0.39
	STI	1	0.39
	AUF	1	0.39
	JC	1	0.39
	Total:	259	100

Note the Acronym: City College of Angeles (CCA); Don Honorio Ventura State University (DHVSU); Pampanga State Agricultural University (PSAU); Republic Central Colleges (RCC); System Plus College Foundation (SPCF); St. Nicholas College of Business and Technology (SNC); Holy Angel University (HAU); Global Knowledge Academy (GKA); Mabalacat City College (MCC); STI-College Angeles (STI), Angeles University Foundation (AUF); Jocson College (JC)

Table 2 summarizes the results of construct validity and reliability. The composite reliability is similar to Cronbach’s alpha, which should have a value of greater than 0.70 to be reliable and accepted, similar to rho_A (Davis, 2021; Glen, 2020), while the Average Variance Extracted (AVE) should have a threshold of at least 0.50 and above to be valid (Alarcón et al., 2015). In line with this, all were obtained in the study, indicating the construct as valid and reliable. The developed and validated measure for detecting characteristics that may impact student satisfaction with Google Classroom was shown to be significant in this study.

Table 2. Construct’s Validity and Reliability

Codes-Construct’s Validity and Reliability: Retained Items					
Perceived Usefulness	FA	Alpha	Rho	Comp	AVE
PU1: Google classroom is one of the excellent tools used for demonstrating an activity	.795				
PU2: The use of google classroom enables students to submit the assignment on time.	.846				
PU3: The grading system of google classroom assists me in monitoring my performance.	.778	.876	.879	.910	.670
PU4: I find google classroom effective and productive to use.	.879				
PU5: I find google classroom applicable in all academic courses.	.790				
Perceived Ease of Use					
PEOU1: The ease of using google classroom enables me to access course materials.	.760				
PEOU2: Google classroom makes it easier to avoid future academic difficulties.	.822				
PEOU3: Google classroom is convenient and user-friendly for classes and exams.	.828	.878	.879	.911	.673
PEOU4: Signing up and navigating google classroom is easy.	.836				
PEOU5: The system of google classroom is easy to understand.	.852				
Information Quality					
IQ1: Google classroom provides students with accurate information.	.845				
IQ2: The information provided by google classroom is relevant and easy to understand.	.823				
IQ3: Google Classroom provides up-to-date and reliable information to the students.	.844	.888	.888	.918	.691
IQ4: Google classroom arranged content that makes it easy to understand and use.	.835				
IQ5: The information on google classroom is accurate (free from errors).	.809				
System Quality					
SQ1: Google Classroom provides immediate response to the students.	.814				
SQ2: The system provides a displayed organization of information needed by the students.	.862				
SQ3: Accessing information in google classroom is simple to locate.	.828	.897	.899	.924	.708
SQ4: Google Classroom has the necessary features needed to function (set classroom, add content, etc.).	.873				

SQ5: Google classroom has attractive features that appeal to students.	.828				
Service Quality					
SEQ1: The service provided by google classroom is helpful.	.858				
SEQ2: The service provided by google classroom is accessible anytime.	.824				
SEQ3: The service provided by google classroom is responsive to the user's request.	.873	.904	.904	.929	.722
SEQ4: Google classroom provides a service that makes students do their job well.	.852				
SEQ5: Google Classroom keeps records confidential between student and teacher.	.841				
Communication Quality					
CQ1: I feel comfortable having a conversation through google classroom for the activity.	.810				
CQ2: Google classroom is pleasant to use as a way of communication.	.822				
CQ3: I did not encounter any issues while interacting with others using google classroom.	.765	.873	.878	.908	.664
CQ4: My presence is recognized while doing and submitting an activity via google classroom.	.827				
CQ5: Google Classroom brings comfort to me as I communicate the activities for collaboration.	.847				
Google Classroom Satisfaction					
GCS1: I like google classroom as a learning initiative.	.847				
GCS2: Google Classroom is my first choice in active learning compared to other methods.	.818				
GCS3: I would recommend google classroom to other classes and subjects.	.888	.910	.912	.933	.737
GCS4: I feel satisfied as far as google classroom is concerned.	.874				
GCS5: I feel pleased with the experience of using google classroom.	.862				

Bootstrap Report: Path Coefficients

The path formed by the coefficients is comprised of p-values, standard deviation, and t-statistics and the significance threshold is set at 0.05. Table 3 shows the Patch Coefficient values.

Table 3. Path Coefficients

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
CQ-> GCS	0.372	0.363	0.073	5.086	0.000
IQ -> CQ	0.625	0.629	0.040	15.534	0.000
PEOU -> SEQ	0.698	0.701	0.039	17.880	0.000
PU -> IQ	0.756	0.762	0.030	25.092	0.000
PU -> PEOU	0.728	0.729	0.039	18.642	0.000
PU -> SQ	0.369	0.372	0.066	5.590	0.000
SEQ -> SQ	0.499	0.499	0.064	7.821	0.000
SQ -> GCS	0.500	0.509	0.064	7.772	0.000

Table 3 shows that *Communication Quality* → *Google classroom satisfaction* with a p-value of 0.000, supports the *Hypothesis 1: communication quality significantly influences google classroom satisfaction*, where $p < 0.05$. This specify that communication quality of google classroom has positive impact on google classroom satisfaction with a significant result.

Information Quality → *Communication Quality* with p-value of 0.000, supports the *Hypothesis 2: information quality has influence on communication quality* with $p < 0.05$. This shows that information quality has positive impact to communication quality that satisfy student. Therefore, the link found significant in google classroom satisfaction.

Perceived Ease of Use → *Service Quality* with p-value of 0.000, supports *Hypothesis 3: perceived ease of use has influence on service quality* with $p < 0.05$. This implies that google classroom perceived ease of use greatly influences the service quality. In line with this, the result found significant.

Perceived Usefulness → *Information Quality* with p-value of 0.000, supports the *Hypothesis 4: perceived usefulness has significant impact on information quality* with $p < 0.05$. This shows that google classroom usefulness largely influences the information quality. Along with this, the result found significant.

Perceived Usefulness → *Perceived Ease of Use* with p-value of 0.000, supports *Hypothesis 5: perceived usefulness has significant impact on perceived ease of use* with $p < 0.05$. This implies that google classroom perceived usefulness significantly affect perceived ease of use. In conclusion the result found to be significant.

Perceived Usefulness → *System Quality* with p-value of 0.000, supports *Hypothesis 6: perceived usefulness has influence on system quality* where $p < 0.05$. This illustrates that google classroom’s usefulness has significant impact on the system quality. In line with this, the result is significant.

Service Quality → *System Quality* with p-value of 0.000, supports *Hypothesis 7: service quality has influence on system quality* where $p < 0.05$. This indicates that google classroom service quality greatly influences system quality, that concludes the result to be significant.

System Quality → *Google Classroom Satisfaction* with p-value of 0.000, supports *Hypothesis 8: system quality has influence on google classroom satisfaction* where $p < 0.05$. It displays that google classroom system quality has great influence on google classroom satisfaction, that concludes that the result is significant.

Figure 2 illustrates the relationship of the factors mentioned influencing students' satisfaction with Google Classroom.

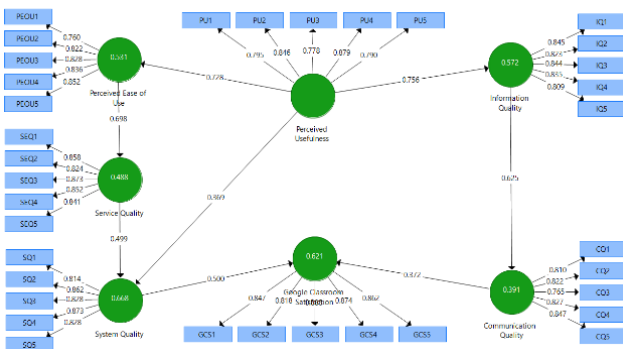


Figure 2. Google Classroom Satisfaction Program Algorithm Model

Figure 2 shows factors affecting Google Classroom satisfaction among the student in colleges and universities around Pampanga. SmartPLS Algorithm were utilized to show r-squared of each variable wherein perceived ease of use has the total r-squared of 0.531, service quality that has 0.488 r-squared, system quality with 0.668 r-squared, google classroom satisfaction with 0.621 r-squared, communication quality with 0.391 r-squared and information quality with 0.572 r-squared. While Figure 2 of this study shows the bootstrapped model of the factors influencing students' satisfaction with Google Classroom.



Figure 3. Google Classroom Satisfaction Bootstrapping Model

Figure 3 illustrates the p-values on the inner arrows and outer arrows of the factors influencing students' satisfaction with Google Classroom among the college and university students in Pampanga. Based on the analysis, the communication quality significantly influences google classroom satisfaction, information quality has greatly influenced communication quality, google classroom perceived ease of use greatly influences the service quality, perceived usefulness has significant impact on information quality, perceived usefulness has significant impact on perceived ease of use, service quality has influence on system quality, and system quality has influence on google classroom satisfaction, lastly, the hypothesis of google classroom perceived usefulness is significantly

influence system quality. Therefore, all the hypotheses are proven to be significant as well as the outer loadings of each variable. The next chapter includes further discussion and conclusion of the study.

Discussion

Recapitulation of the Study

The unexpected situation brings individuals the sense of being resourceful. The COVID-19 pandemic brought significant changes in the education system, changing the classroom setup to virtual classes. In line with this, various schools, colleges, and universities have to implement a variety of educational platforms and software that enable the teaching and learning process to continue despite the situation. Google Classroom has become one of the most suitable applications available for any mobile or web application that students and teachers can use. This educational platform is easy to use and is associated with various applications from Google, such as Google Drive, Calendar, Forms, YouTube, and Gmail. In addition, it assists teachers in uploading instructional materials and creating quizzes and activities while students utilize it to access that information for their studies. This study will benefit the academic field, officials, teachers, and students as they will identify the efficiency, convenience, and effectiveness of Google Classroom as the students are satisfied with using it. As Google Classroom is continuously used, researchers aim to investigate the factors that affect student satisfaction with Google Classroom among students from higher education in Pampanga. Specifically, the role of PU and PEOU factors in the D&M ISS factors towards Google Classroom satisfaction.

The purpose of this study is to determine the significant connection between TAM and D&M ISS model variables, namely perceived usefulness, perceived ease of use, information quality, system quality, service quality,

communication quality, and Google Classroom Satisfaction. The TAM and the D&M ISS models were used to create the research framework and illustrate the connection between the variables. Researchers used SmartPLS 3 for path analysis that tests the research hypothesis with a value of ≤ 0.05 , where eight constructs are significant and attained. Nonetheless, the study can be used as a starting point for further research on other variables and theoretical models that affect Google Classroom satisfaction.

Objectives Achieved on the Role of Perceived Usefulness and Ease of use in D&M ISS factors towards Google Classroom Satisfaction

Perceived usefulness (PU) and perceived ease of use (PEOU) are two TAM variables, as well as the D&M ISS model variables, that are included in the research model which investigates Google Classroom satisfaction. The PU and PEOU act as determinants, which means a role that affects the outcome. The result of the analysis and investigation shows that the determinant roles of PU and PEOU play a significant part in Google Classroom Satisfaction, and it also confirms a positive influence with the D&M ISS model. With the significant determinant role of PU and PEOU in the D&M ISS factors, colleges and universities are pleased and satisfied with the utilization of Google Classroom. Moreover, each of the quality factors of Google Classroom by the D&M ISS model is significant because of the role of PU that makes students satisfied in using the platform.

Objectives Achieved on D&M ISS factors influencing Google Classroom Satisfaction

The research findings successfully investigate the connection between D&M ISS factors, namely information quality, service quality, system quality, and communication quality, in Google Classroom satisfaction among college and university students in Pampanga. The result shows that the D&M ISS variables are significantly influenced by Google Classroom with using a determining role, namely perceived

usefulness (PU) and perceived ease of use (PEOU). The significant result of the analysis leads to the continued utilization of Google Classroom as students are satisfied with the software for educational purposes because of its satisfaction with the various qualities of the D&M ISS model.

Table 4 shows a summary of the hypothesis paths, together with the related t-stats and p-values, which indicate whether or not the hypothesis is supported.

Table 4. Path Coefficients Achieved

Hypothetical paths	T Statistics	P Values	Supported?
H1. Communication Quality significantly influences Google Classroom Satisfaction.	5.086	0.000	Yes
H2. Information Quality has influence on Communication Quality.	15.534	0.000	Yes
H3. Perceived Ease of Use has influence on Service Quality.	17.880	0.000	Yes
H4. Perceived Usefulness has significant impact on Information Quality.	25.092	0.000	Yes
H5. Perceived Usefulness has significant impact on Perceived Ease of Use.	18.642	0.000	Yes
H6. Perceived Usefulness has influence on System Quality	5.590	0.000	Yes
H7. Service Quality has influence on System Quality.	7.821	0.000	Yes
H8. System Quality has influence on Google Classroom Satisfaction.	7.772	0.000	Yes

The summary in Table 4 concludes that eight (8) hypotheses were found to be significant and supported with $p < 0.05$. This implies that participants are satisfied with Google Classroom because of its usefulness, ease of use and various

qualities. Therefore, the college and university student in Pampanga were satisfied with the usability of Google Classroom for education since the pandemic and will probably continue to use it.

Conclusion

The research findings concluded that factors such as information quality, system quality, service quality, communication quality, and the determinant's role of perceived ease of use and usefulness greatly influence Google Classroom satisfaction among higher education students. The analysis showed that perceived usefulness and ease of use are determinants of the D&M ISS factors, which significantly influence Google Classroom satisfaction. Then there is service, system, information, and communication quality that significantly influence Google Classroom satisfaction. In line with this, the factors affecting student satisfaction are valid and significant. In addition, identifying the factors that affect student satisfaction with Google Classroom assists institutions in deciding whether to incorporate the application or use other applicable educational tools for the teaching and learning process during this pandemic. Furthermore, students' satisfaction with Google Classroom will lead to sustained use and enhancement to better assist education, especially in this virtual learning and technology era. Therefore, up to the present, the use of Google Classroom has satisfied students, making student education easier with virtual learning.

Limitation of the study

The research aims to investigate variables of information quality, system quality, service quality, communication quality, and the role of perceived usefulness and ease of use in determining Google classroom satisfaction among college and university students in Pampanga. The scope of the study was limited to TAM and D&M ISS factors, which are known to influence student satisfaction with Google Classroom significantly. The study was limited

to the quantitative research approach of an online cross-sectional survey questionnaire. The only analytical tool adopted is SmartPLS 3, which constructs reliability and validity and identifies the significance among variables.

Participants in an online survey form were confined to the college and university students in Pampanga and did not include anyone outside the province. Respondents were also restricted to the student using Google Classroom as an educational platform. The respondent's qualifications are college or university students currently enrolled in Academic Year 2021-2022. The location of the research is also a restriction. The research is limited to the locality of Pampanga, Philippines. Moreover, due to the pandemic, data collection is online, and the limited period of the development of the study is also an evident limitation.

References

- Abuzant, M., Ghanem, M., Abd-Rabo, A., & Daher, W. (2021). Quality of Using Google Classroom to Support the Learning Processes in the Automation and Programming Course. *International Journal of Emerging Technologies in Learning*, 16(6).
- Alarcón, D., Sánchez, J. A., & De Olavide, U. (2015, October). Assessing convergent and discriminant validity in the ADHD-R IV rating scale: User-written commands for Average Variance Extracted (AVE), Composite Reliability (CR), and Heterotrait-Monotrait ratio of correlations (HTMT). In Spanish STATA meeting (Vol. 39). Universidad Pablo de Olavide.
- Al-Emran, M., & Malik, S. I. (2016). The impact of google apps at work: Higher educational perspective. *Int. J. Interact. Mob. Technol.*, 10(4), 85-88.
- Alhumaid, K., Ali, S., Waheed, A., Zahid, E., & Habes, M. (2020). (PDF) COVID-19 & E-learning: Perceptions & attitudes of teachers towards E-learning acceptance in the developing countries. (n.d.). ResearchGate. DOI: 10.5281/zenodo.4060121.
- Allen, M. (2017). *The SAGE encyclopedia of communication research methods* (Vols. 1-4). Thousand Oaks, CA: SAGE Publications, Inc. DOI: 10.4135/9781483381411
- Almarashdeh, I. (2016). Sharing instructors experience of learning management system: A technology perspective of user satisfaction in distance learning course. *Comput. Hum. Behav.*, 63, 249-255. Available from: <https://www.semanticscholar.org/paper/Sharing-instructors-experience-of-learning-system%3AAlmarashdeh/97e3ff5c21172a00859e97b95e7e52d81217668e>
- Bakhri, S. (2020, October). Assessing Information System Success in E-Learning. In *ICON-ISHIC 2020: Proceedings of the First International Conference on Islamic History and Civilization, ICON-ISHIC 2020, 14 October, Semarang, Indonesia* (p. 307). European Alliance for Innovation. Available from: <http://eprints.eudl.eu/id/eprint/3423/1/eai.14-10-2020.2303856.pdf>
- Beal, V. (2021). What is Google Classroom? *Webopedia*. Available from: <https://www.webopedia.com/definicions/google-classroom/>
- Beaumont, K. (2018). Google Classroom: An online learning environment to support blended learning. *Compass: Journal of Learning and Teaching*, 11(2). Available from: <https://pdfs.semanticscholar.org/1537/78fb6948d9a4f5fc798a359d754f09c09781.pdf>
- Bhandari, P. (2021, February 15). An introduction to quantitative research. Scribbr.

<https://www.scribbr.com/methodology/quantitative-research>

Bhat, A. (2021, July 20). Quantitative Data Collection: Best 5 methods. QuestionPro. <https://www.questionpro.com/blog/quantitative-data-collection-methods/>

Bielefeld, K. (2016, September 21). Ten Reasons Why You Should Use Google Classroom. Ten Reasons Why You Should Use Google Classroom. Available from: <https://blog.mimio.com/ten-reasons-why-you-should-use-google-classroom>

Bondarenko, O. V., Mantulenko, S. V., & Pikilnyak, A. V. (2018). Google Classroom as a Tool of Support of Blended Learning for Geography Students. In CEUR Workshop Proceedings (Vol. 2257, pp. 182–191). Available from: <https://arxiv.org/abs/1902.00775>

Coppola, R., Schembri, R., Manzo, G., & Sgrò, F. (2021). Possible use of technological tools in outdoor movement education. *Journal of Physical Education and Sport*, 21, 702-708. DOI:10.7752/jpes.2021.s1086.

Davis, I. (2021, June 22). Cronbach's Alpha. Statistics Solutions. Available from: <https://www.statisticssolutions.com/cronbachs-alpha/>

Ghofur, A. (2018). Using Google Classroom on Inquiry Based Learning to Improve Students' learning Participation. *Jurnal Penelitian Pendidikan*, 10(2). Available from: <https://core.ac.uk/download/pdf/267087079.pdf>

Glen, S. (2020b, December 4). Reliability and Validity in Research: Definitions, Examples. Statistics How To. <https://www.statisticshowto.com/reliability-validity-definitions-examples/>

Heggart, K. R., Yoo, J., & Heggart, K. (2018). Getting the Most from Google classroom: A pedagogical framework for tertiary educators. *Australian Journal of Teacher Education*, 43(3). Retrieved from <http://ro.ecu.edu.au/ajte/vol43/iss3/9>, 140–153

Khairani, A., Daud, A., & Adnan, M. (2020). Students' acceptance Of the Use of Google Classroom as A Platform in Blended Learning. *AL- ISHLAH: Jurnal Pendidikan*, 12(1), 1-16. DOI: <https://doi.org/10.35445/alishlah.v12i1.193>

Mohd Shahrane, I. N., Jamil, J., & Mohamad Rodzi, S. S. (2016). The application of Google Classroom as a tool for teaching and learning. *Journal of Telecommunication, Electronic and Computer Engineering*, 8(10), 5-8. Available from: <https://jtec.utem.edu.my/jtec>

National Business Research Institute. (2017, November 22). Methods of Survey Data Collection. NBRI. <https://www.nbrii.com/customer-survey-white-papers/methods-of-survey-data-collection/>

Ohliati, J., & Abbas, B.S. (2019). Measuring Students Satisfaction in Using Learning Management System. *International Journal of Emerging Technologies in Learning (iJET)*. <https://online-journals.org/index.php/i-jet/article/view/9427/5512>

Okmawati, M. (2020). The use of Google Classroom during pandemic. *Journal of English Language Teaching*, 9(2), 438-443. DOI: <https://doi.org/10.24036/jelt.v9i2.109293>

Oktaria, A. A., & Rahmayadevi, L. (2021). Students' Perceptions of Using Google Classroom During the Covid-19 Pandemic. *International Journal of Educational Management and Innovation*, 2(2), 153. DOI: 10.12928/ijemi.v2i2.3439

Olufunke, O. F. T. (2020). Facilitating Efficient Teaching and Learning through a Technology-Based Google Classroom as a Social Tool in Nigerian Tertiary Institutions. Retrieved from: <https://ijisrt.com/assets/upload/files/IJISRT20MAY818.pdf>

Putra, I. N. T. D. (2020). Students' Attitudes in Learning English for Tourism Using Google Classroom in Mataram Tourism College. *Jo-ELT (Journal of English Language Teaching) Fakultas Pendidikan Bahasa & Seni Prodi Pendidikan Bahasa Inggris IKIP*, 7(1), 9-17. DOI: <https://doi.org/10.33394/jo-elt.v7i1.2735>

Rahmawati, B. F. (2020, May). Learning By Google Classroom in Students' Perception. In *Journal of Physics: Conference Series* (Vol. 1539, No. 1, p. 012048). IOP Publishing. Available from: <https://iopscience.iop.org/article/10.1088/1742-6596/1539/1/012048/meta>

Salim, M., Alfansi, L., Anggarawati, S., Saputra, F., & Afandy, C. (2021). The role of perceived usefulness in moderating the relationship between the DeLone and McLean model and user satisfaction. *Uncertain Supply Chain Management*, 9(3), 755-766. DOI: [10.5267/j.uscm.2021.4.002](https://doi.org/10.5267/j.uscm.2021.4.002)

Sander, T., & Lee, T. (2015). The Advantages and Disadvantages of SmartPLS Software. Available from: <https://www.semanticscholar.org/paper/The-Advantages-and-Disadvantages-of-SmartPLS-Sander-Lee/be336872a6530ae4345e509e39ffb6479d5f3ac0>

Saputri, V. N. D. (2020). Students' perceptions Toward the Use of Google Classroom in Teaching and Learning Process (Doctoral dissertation, Universitas Negeri Semarang). Official URL: <https://lib.unnes.ac.id/>

Sari, N. W. W., Wulansari, T. T., Yanuartha, W., Sipayung, M. S., & Pribadi, A. S. (2021, April). Factors Which Influence the Success of Google Classroom Based on Age. In *Journal of Physics: Conference Series* (Vol. 1807, No. 1, p. 012016). IOP Publishing. <https://iopscience.iop.org/article/10.1088/1742-6596/1807/1/012016/meta>

Sudarsana, I. K., Putra, I. B. M. A., Astawa, I. N. T., & Yogantara, I. W. L. (2019, March). The use of Google classroom in the learning process. In *Journal of Physics: Conference Series* (Vol. 1175, No. 1, p. 012165). IOP Publishing. Available from: <https://iopscience.iop.org/article/10.1088/1742-6596/1175/1/012165/meta>

Sulisworo, D., Ummah, R., Nursholikh, M., & Raharjo, W. (2020). The Analysis of The Critical Thinking Skills between Blended Learning Implementation; Google Classroom and Schoology. *Universal Journal of Educational Research*, 8(3B), 33-40. DOI: [10.13189/ujer.2020.081504](https://doi.org/10.13189/ujer.2020.081504)

Tamin, N. H., & Mohamad, M. (2020). Google Classroom for Teaching and Learning in Malaysia Primary School during Movement Control Order (MCO) due to Covid-19 Pandemic: A literature review. *International Journal of Multidisciplinary Research and Publications*, 3(5), 34-37. Available from: <http://ijmrmap.com/wp-content/uploads/2020/11/IJMRAP-V3N5P33Y20.pdf>

Uddin, Md., Ali, K., & Khan, M. A. (2018). Impact of service quality (SQ) on student satisfaction: empirical evidence in the higher education context of emerging economy. *AL-ABQARI: Journal of Islamic Social Sciences and Humanities*. URI: <http://abqarijournal.usim.edu.my/index.php/abqari/article/view/8>

Ventayen, R. J. M., Estira, K. L. A., De Guzman, M. J., Cabaluna, C. M., & Espinosa, N. N. (2018). Usability evaluation of google classroom: Basis for the adaptation of gsuite e-learning platform. *Asia Pacific Journal of Education, Arts and Sciences*, 5(1), 47-51. <http://apjeas.apjmr.com/>

Wijaya, A. (2016, February). Analysis of factors affecting the use of Google Classroom to support lectures. In The 5th International Conference on Information Technology and Engineering Application (ICIBA2016). Bina Darma University. URI: <http://eprints.binadarma.ac.id/id/eprint/2777>

Zuniga-Tonio, J. (2021). Google Classroom as a Tool of Support for Flexible Learning in the New Normal. *Journal of Education, Management and Development Studies*, 1(2), 25-39. <https://doi.org/10.52631/jemds.v1i2.20>