User Acceptance of Google Classroom-Assisted Learning: The Case of Malaysian Form Six Economics Students

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Abstract. As a result of the COVID-19 pandemic situation, educators in Malaysia have resorted to the use of the learning medium Google Classroom as an alternative to existing online teaching methods. Past studies have focused on direct and indirect factors towards the intention to use and the use of Google Classroom in public institutes of higher learning. This study therefore aimed to identify the level and tendency of acceptance items of Google Classroom-assisted learning among Form Six economics students based on demographic factors. A questionnaire was distributed to 206 students in the state of Melaka, Malaysia. Descriptive analysis was used to measure the level of user acceptance of Google Classroom, and the Rasch measurement model of differential item functioning (DIF) was used to identify the tendency of items based on demographic factors. From the findings of the study, the overall analysis of student acceptance of Google Classroom showed that it was at a moderately high level. DIF analysis proved that there were differences in the propensity to adopt Google Classroom based on gender, ethnicity, experience, and frequency of internet usage. The findings of this study will help policymakers to issue guidelines, and assist school management and teachers to plan for technological literacy training to educate students in schools.

Keywords: acceptance; differential item functioning (DIF); economics education; Google Classroom; unified theory of acceptance and use of technology (UTAUT)

1. Introduction
Educators in Malaysia have embraced the Google Classroom teaching medium. The Google Classroom learning management system (LMS) was pioneered in the

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second phase of the 1BestariNet Services Project in June 2019 (Ministry of Education [MoE] Malaysia, 2019). The MoE Malaysia issued a guideline permitting students to bring personal devices to school to facilitate the execution of a virtual learning environment (MoE Malaysia, 2018). This shows a substantial dedication to improving the existing education system to be on par with those of developed countries. The usage of Google Classroom has garnered more attention during the outbreak of COVID-19 since the beginning of 2020. COVID-19 pandemic circumstances that hit the country prompted the implementation of hybrid learning. Google launched Google Classroom in August 2014 for educational purposes (Iftakhar, 2016). Approximately 150 million users employed Google Classroom worldwide by 2021 (Lazare, 2021). Meanwhile, statistics have shown that users in the UK had already downloaded around 603,000 times from the Google Classroom app as of January 2021 (Clark, 2022). Statistical reports have recorded that Malaysia has the second highest number of users globally out of 57 countries registered, which is higher than the number of users from the United States, Hong Kong, Singapore, and Canada (Google Trends, 2021).

Empirical data have verified that blended or hybrid learning methods with the help of Google Classroom constructively enhance thinking skills (Sulisworo et al., 2020), student satisfaction (Almusharraf & Khahro, 2020; De Campos Filho et al., 2019), student engagement (Abazi-Bexheti et al., 2018), self-efficacy (Noornadiah & Khoo, 2021), and student attitude towards a subject (Wan Nazari et al., 2019). Nevertheless, existing economics learning still depends on conventional learning techniques. Researchers have agreed that passive learning approaches do not stimulate economics learning (Hettler, 2015; Nepal & Rogerson, 2020; Ramlee et al., 2020). Past analyses have proven that learning aided with technology positively influences learning (Khoo et al., 2019). The Google Classroom application has been acknowledged as an active and autonomous learning tool (Hidayat et al., 2019). Therefore, it presents an opportunity to help economics teachers enhance the quality of teaching and boost student academic accomplishment. This method is appropriate to be executed for economics students in Form Six because, according to Adams et al. (2020), students under the age of 20 tend to interact more with peers through LMSs and group learning compared to other age groups. Learning with the help of the Google Classroom LMS implies a virtual classroom learning concept devised to streamline the learning process and support existing approaches. Some of the benefits of utilizing Google Classroom are that it saves costs (Maheran et al., 2021), offers ease of information access (Dash, 2019; Memon et al., 2019), aids management of learning materials (Priyaadharshini & Vinayaga Sundaram, 2018; Shaharanee et al., 2016), and encourages interaction (Hidayat et al., 2019).

Nonetheless, the Google Classroom application is still novel and needs further empirical examination on its usage efficacy (Francom et al., 2020). Therefore, consumer acceptance of new technology needs to be considered to guarantee effectiveness (Ghazal et al., 2017; Saroia & Gao, 2018; Zulfikar et al., 2019). Since the introduction of the Google Classroom application, much research has been conducted on user acceptance of Google Classroom (Al-Maroof & Al-Emran, 2018; Kumar & Bervell, 2019; Nor Zanira & Hafizul, 2020). Preliminary analyses

have concentrated more on direct and indirect components influencing user intent and usage of Google Classroom applications (Al-Maroof & Al-Emran, 2018; Hidayat et al., 2019; Kumar & Bervell, 2019). Researchers have even reflected on the acceptance of Google Classroom applications in the face of pandemics (Fauzi et al., 2021; Pratama, 2021). Nevertheless, we have discovered gaps in understanding user behavior, precisely personality traits and other individual-related factors. Moreover, past studies have focused more on students in public institutes of higher learning (Abazi-Bexheti et al., 2018). Furthermore, the use of Google Classroom is still less explored in education in Malaysia, hence the need to review the student acceptance of this application. Based on the unified theory of acceptance and use of technology (UTAUT), Venkatesh et al. (2003) established that individual acceptance of new technology is based on four key factors: performance expectancy, effort expectancy, social influence, and facilitating conditions, as described in Table 1.

Table 1. Student acceptance factors towards Google Classroom

Factor	Description
Performance expectancy	Performance expectancy refers to students' level of confidence that the use of Google Classroom helps them improve performance.
Effort expectancy	Effort expectancy refers to the Google Classroom facilities.
Social influence	Social influence relates to the individual's trust in the stakeholders, which drives the individual to use Google Classroom.
Facilitating conditions	Facilitating conditions are when a student believes that technical infrastructure exists to support the Google Classroom system or environment.

Source: Nor Zanira and Hafizul (2020)

This study attempted to address the following research objectives:
1. To identify the level of student acceptance of Google Classroom.
2. To identify the differential item functioning (DIF) of Google Classroom acceptance based on demographic factors.

2. Research Methodology

2.1 Respondents and Location of the Study

The schools involved in this study are situated in Melaka, Malaysia. The schools were selected from heterogeneous samples with characteristics similar to the population. Each selected school had the exact characteristics of Form Six students who enrolled in the economics stream learning the same economics syllabus. The sample of this study was selected based on Krejcie and Morgan (1970) and involved 206 Form Six economics students in semester 1.

2.2 Research Instruments

The Google Classroom acceptance questionnaire used in this study was based on Mohd Paris and Saedah's (2016) instrument, and was modified according to the suitability of the study context. Part A consisted of demographic information, part B of performance expectancy (4 items), part C of effort expectancy (3 items), part D of social influence (3 items), and part E of facilitating conditions (3 items). A five-point Likert scale, ranging from strongly disagree to strongly agree, was

used to make it easier for respondents to indicate their level of agreement. The instrument achieved reliability with a Cronbach alpha of 0.92. Since Cronbach's alpha was higher than 0.70, it proved a high-reliability standard (Sekeran & Bougie, 2010). It confirmed that the items were acceptable and could be used as part of the actual study instrument.

2.3 Data Gathering Procedure

This survey study was conducted using a quantitative approach to assess students' acceptance of the use of Google Classroom. The respondents were briefed on the use of Google Classroom before the questionnaire instrument was distributed. A voluntary declaration letter of participation was distributed to each respondent to seek permission to use the data provided. All respondent information obtained is confidential and limited for research purposes only. Twenty minutes was allotted to complete the questionnaire. Once the respondents had completed the questionnaire, we gathered and coded the data collected.

2.4 Ethical Considerations

The participating students were eligible to be registered as school candidates. Before the questionnaire was distributed, we followed several procedures to request permission from specific parties. These included: i) Graduate Studies Institution, Sultan Idris University of Education, ii) Education Policy Planning and Research Division, MoE Malaysia, iii) Malacca State Education Department, and iv) school principals. Permission from the relevant parties was required to enter the government premises, specifically that of the schools.

2.5 Data Analysis

Descriptive analysis using mean scores was used to report the level of user acceptance of Google Classroom. We employed the Rasch measurement model and DIF analysis to evaluate the tendency of respondents with the same ability but from different backgrounds towards an item. Previous studies have tended to use classical measurement theory to interpret data cumulatively. Dodeen and Johanson (2001) performed DIF tests on respondents' gender and background to measure whether the implementation of assessment was fair and equitable. DIF measurements that recorded values exceeding controlled values (DIF ≥ 0.5 logits, t > ± 2.0, or p < 0.5) revealed different item functions (Bond & Fox, 2015; Boone et al., 2013). Accordingly, this study completes these previous findings by identifying functional differences of items in the instruments used. Table 2 shows the mean score interpretation of the descriptive analysis.

Table 2. Mean score interpretation of the descriptive analysis

Mean score	Level
1.01–2.00	Low
2.01–3.00	Moderately low
3.01–4.00	Moderately high
4.01–5.00	High

Source: Nunnally and Bernstein (1994)

3. Results

3.1 Respondents' Demographics

The demographic profile distribution of the study respondents is shown in Table 3, consisting of gender, ethnicity, location of residence, estimated family income, experience of using devices, and frequency of internet usage.

Table 3. Demographic profile distribution of respondents

Item	Characteristic	Percentage
Gender		
	Female	68.9
	Male	31.1
Ethnicity		
	Malay	31.6
	Chinese	64
	Indian	4.4
Location of residence		
	Urban	69.4
	Rural	30.6
Family income		
	Less than RM4849.00	46.6
	RM4849.00 to RM10,959.00	45.6
	More than RM10,959.00	7.8
Experience of using devices		
	Less than 4 years	10.2
	4 to 7 years	48.1
	More than 7 years	41.7
Frequency of internet usage		
	1 to 6 hours	48.6
	7 to 12 hours	40.3
	More than 12 hours	11.1

The sample contained more female (68.9%) than male respondents (31.1%). Regarding ethnicity, the sample comprised a majority of Chinese respondents (64%), followed by Malay (31.6%) and Indian (4.4%). Concerning their place of residence, 69.4% of respondents were from urban areas, with the rest (30.6%) living in rural areas. Meanwhile, there was an almost equal number of respondents from families earning less than RM4849.00 (B40) (46.6%) and from families earning between RM4849.00 and RM10,959.00 (M40) (45.6%). Respondents from families earning more than RM10,959.00 (T20) comprised the smallest group in this category (7.8%). Regarding device-usage experience, analysis showed that 48.1% of respondents had 4 to 7 years' experience using devices, followed by those with more than 7 years (41.7%), and less than 4 years (10.2%). Lastly, respondents had to indicate with what frequency (hours) they used the internet daily. Almost half (48.6%) allocated 1 to 6 hours to internet usage per day, with 40.3% spending 7 to 12 hours on the internet per day, and the rest (11.1%) spending more than 12 hours on the internet per day.

3.2 Respondents' Level of Acceptance Towards Google Classroom-Assisted Learning

Table 4 displays the analysis of respondents' acceptance of Google Classroom-assisted learning. Overall, the level of acceptance by respondents was high (M = 3.40, SD = 0.72). Comparison of the means of the Google Classroom acceptance factors showed that the highest mean value is attributed to facilitating conditions (M = 3.61, SD = 0.87), whereas the social influence factor received the lowest mean value (M = 3.02, SD = 0.93).

Table 4. Analysis summary of respondents' level of acceptance of Google Classroom-assisted learning

Factor	Mean	Acceptance level
Performance expectancy	3.45	Moderately high
Effort expectancy	3.53	Moderately high
Social influence	3.02	Moderately high
Facilitating conditions	3.61	Moderately high
Acceptance of Google Classroom (overall)	3.40	Moderately high

3.3 Differences in Respondents' Acceptance of Google Classroom-Assisted Economics Learning as per Demographic Factors

Next, the DIF was conducted to evaluate the tendency of respondents with similar characteristics and abilities towards an item. Analysis showed that 6 out of 13 items demonstrated the different functions of items based on demographic factors, as summarized in Table 5. (The whole list with items is presented in Appendix 1.)

Table 5. DIF analysis summary of acceptance of Google Classroom usage based on demographics

	Item	Demographics with DIF
E1	Google Classroom can help with my economics learning	
E2	Learning using Google Classroom can be done anywhere at any time	
E4	Google Classroom helps me learn in groups	
E5	Google Classroom makes it easy for me to interact with friends	
E10	Teachers often help me use Google Classroom	
E13	My friend is willing to assist if I need help using Google Classroom	

Note: = gender; = ethnicity; = frequency of internet usage; = usage experience

Figure 1 illustratively summarizes the person DIF plot by gender. Group 1 represented the female and group 2 the male group. Three items in the study had gender-based tendencies, namely E4, E5, and E13. Items E4 and E5 received preference among male respondents. This signified the tendency among male students compared to female students to engage in group learning and interaction

through learning mediums using Google Classroom. Contrarily, item E13 received preference among female respondents, confirming that female students tend to use Google Classroom with the help of their peers.
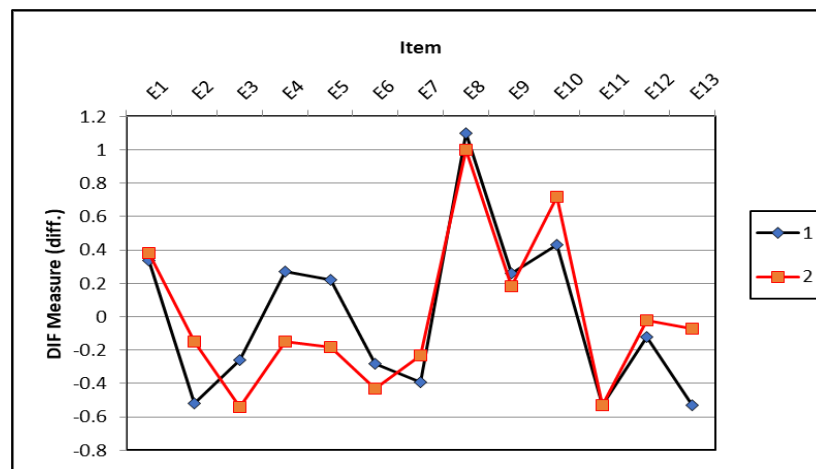
Note: 1 = female; 2 = male

Figure 1. Person DIF plot based on gender

DIF analysis by ethnicity showed that one item (E10) received a score outside the required p-value (p < 0.05). The results demonstrated that Malay respondents had a higher tendency to learn how to use Google Classroom from the teacher.

Figure 2 illustrates the overall person DIF plot based on the duration of device-usage experience.
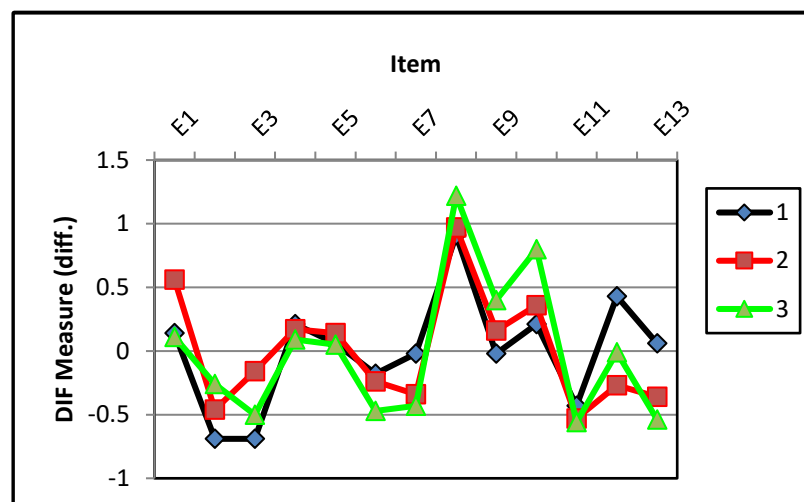
Note: 1 = less than 3 years; 2 = 4 to 7 years; 3 = more than 7 years

Figure 2. Person DIF plot based on usage experience

Category 1 represented a period of less than three years' experience (novice group); category 2 represented four to seven years; and category 3 represented more than seven years (skilled group). Based on the DIF analysis on the period of experience of using the platform, two items indicated the tendency because they received a score outside the required p-value (p < 0.05), namely items E1 and E10. Respondents in the less than three and more than seven years of experience

categories indicated that using Google Classroom could help them carry out economics learning activities. In addition, findings revealed that respondents in the novice category needed more teacher support to help them in the learning environment using Google Classroom compared to the other categories of respondents.

Figure 3 illustrates the person DIF plot according to the frequency of internet usage per day.
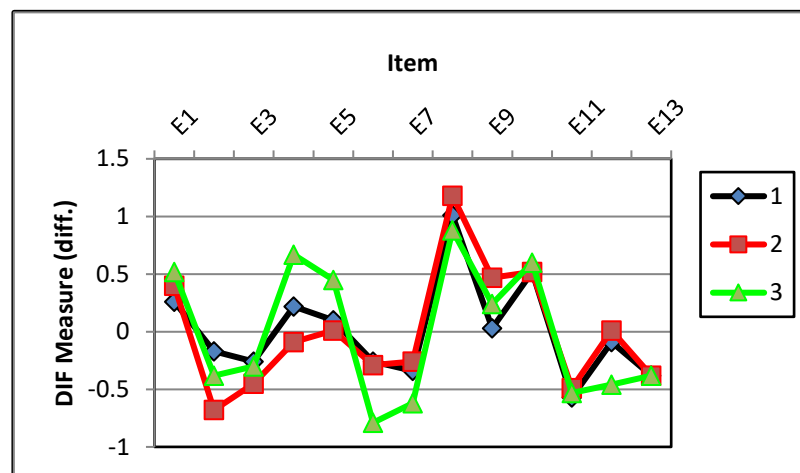
Note: 1 = less than 6 hours; 2 = 7 to 12 hours; 3 = more than 12 hours
Figure 3. Person DIF plot based on the frequency of daily internet usage

Group 1 represented respondents frequenting the internet less than 6 hours a day; group 2 represented those with 7 to 12 hours per day; and group 3 represented those with over 12 hours per day. Based on respondent usage rate, two items showed a tendency, because they received scores outside the required p-value ($p < 0.05$), namely items E2 and E4. Group 2 expected that using Google Classroom would help them improve their performance as their usage was not limited to time and place. In addition, this group believed that using Google Classroom was useful in a group learning environment.

Lastly, the DIF analysis by location and family income did not yield different item functions. Therefore, this analysis proved that user acceptance by residential location (urban and rural) and socioeconomic factors had an equivalent tendency by respondents towards the use of Google Classroom.

4. Discussion
The objectives of this study were to identify the level of user acceptance by students of Google Classroom and to identify the DIF of Google Classroom acceptance based on demographic factors. The prevalent acceptance of the use of Google Classroom among the participating economics students was moderately high. The DIF analysis further verified differences in the propensity towards Google Classroom acceptance based on gender, ethnicity, experience, and frequency of internet usage.

Local reports established that students' acceptance of the use of Google Classroom was positive (Nor Zanira & Hafizul, 2020; Syed Ahmad et al., 2020). The factors of performance expectancy, effort expectancy, social influence, and facilitating conditions influence an individual's intention to employ new technology (Azizi et al., 2020). Furthermore, this study discovered that the facilitating conditions factor recorded the highest mean, followed by effort expectancy, performance expectancy, and social influence, respectively. It thus confirmed that respondents had adequate facilities to enable them and their teachers to use the Google Classroom application. UNICEF Malaysia (2020) estimated that 9 out of 10 children between 5 and 17 years old use the internet. Al-Maroof and Al-Emran (2018) and Kumar et al. (2020) maintained that the principal reason for acceptance of Google Classroom is due to the usage factor and ease of use. Consequently, the ease of use and expected benefits of using technology among the current generation have improved, because Generation Z students have been exposed to the technology since a young age. Nonetheless, the social influence factor recorded the lowest score. This finding shows that respondents received less support from certain parties, such as teachers and schools, to use Google Classroom in economics learning. Teachers do not apply technological elements in face-to-face teaching (Rasheed et al., 2019) and are satisfied with traditional economics teaching approaches (Elpisah & Bin-Tahir, 2019).

According to Padilla-Meléndez et al. (2013), there are considerable distinctions in attitudes and intentions towards the use of technology according to gender. The current study substantiated this in that the male respondents engaged in group learning and interacted using Google Classroom learning mediums more than the female respondents. This conclusion aligns with previous reports that male students are more excited to engage in online learning activities than female students (Al-Emran et al., 2019; Gameel & Wilkins, 2019). Naresh et al. (2016) added that male students are more comfortable using technology for learning. Males can use more learning strategies and have better technical skills than females (Yu, 2021). Besides, this study confirmed that female students were more likely to receive peer support to use Google Classroom. Internet overdependence among male internet users in Malaysia is more common than among female internet users (Ching et al., 2017; Malaysian Communications and Multimedia Commission [MCMC], 2018). According to Wang et al. (2009), the gender factor moderates the impact of social influence and self-management of learning on the intention to use m-learning. However, past studies from Terzis and Economides (2011) and Decman (2015) reported no difference in students' online learning acceptance based on gender.

The current study also unveiled, regarding ethnicity, that Malay respondents had a greater tendency to learn to use Google Classroom from the teachers compared to respondents from other ethnicities. The influence of ethnicity is also prominent in the report by Adams et al. (2020), which showed that Malay students found it easier to concentrate on online tasks compared to Indian and Chinese students. Compared with other ethnic groups in Malaysia, the Chinese ethnic group has more computers, spends more time online, and uses the internet more frequently (Soh et al., 2012). This finding is consistent with those from investigations done in

the southeastern U.S., as Ashong and Commander (2012) highlighted differences in perception by ethnicity. They found that although all African-American and white students had positive views on online learning, African-American students reported significantly fewer positive views on asynchronous characteristics. Therefore, there is a perceived tendency to accept Google Classroom-assisted learning based on ethnicity.

Concerning years of experience, respondents with less than three and over seven years of usage experience, respectively, believed that Google Classroom could help them carry out economics learning activities. Nonetheless, they needed usage support from teachers, especially the novice group. These findings are in line with those by Cheng and Yuen (2019) that students need the help of friends and teachers regarding the use of technology early. This stage signifies when they perceived technology as applicable and genuinely acknowledged that the use of Google Classroom could help them in economics learning. If this confirmation stage meets the initial expectations, the students will be satisfied. Therefore, in the early stages of the implementation of Google Classroom, teachers should afford guidance, especially to students who are new to the use of Google Classroom, to drive their self-efficacy so that students can be independent. However, Van Alten et al. (2020) indicated that students' initial knowledge did not significantly impact learning activities involving self-learning.

In addition, it was found that most respondents spent 7 to 12 hours on the internet per day. DIF analysis showed that respondents in this group tended to expect the use of Google Classroom to help them improve performance because its use is not limited to time and place. The majority of consumers in Malaysia spend approximately one to four hours using information technology devices per day (MCMC, 2020a). Al-Emran et al. (2019) mentioned that students and academics who own smartphones are more likely to use the mobile learning approach than those who do not have devices. In addition, students who frequently use the internet believed that the use of Google Classroom was useful in a group learning environment. Google Classroom can be a medium of learning in a flipped classroom, where teachers can prepare materials before the teaching session. It allows students to prepare in advance before the topic is taught. Learning materials such as videos, pictures, and notes are uploaded to the Google Classroom application for easy access by students. This allows students the freedom to determine their time and place of learning.

Regarding residential location and socioeconomic status, the DIF analysis verified no differences in the propensity of respondents towards Google Classroom acceptance. According to Chen and Liu (2013), government policy has significantly reduced the rural-urban knowledge divide. In 2020, the government propelled the Jalinan Digital Negara (JENDELA) (2020–2022) plan by concentrating on learning at home as one of the principal plans (MCMC, 2020b). Diverse government endeavors help diverse groups of students gain access, especially those from rural and low-income families. One such endeavor is the Malaysia Family Device Package, which allows all Malaysians to receive/upgrade selected 4G VoLTE mobile devices for free. In addition, the Malaysian Family

Youth Package is an initiative to help teenagers and students (21 years and below) acquire internet access for online learning and to increase productivity. This initiative authorizes every student to gain equal access and exposure using the Google Classroom learning app.

This study was limited to economics students at the Form Six level in one state. The findings acquired were based on the results of survey information using a questionnaire only. The variables measured also did not involve mediator and moderator factors that could influence student acceptance of the use of Google Classroom. In an attempt for future advances in this field, we recommended using a larger sample from various states involving economics students at the matriculation and diploma levels. In addition, to obtain more comprehensive data, we advise that subsequent research use a qualitative approach such as the interview method.

5. Conclusion

In conclusion, this study examined the level of acceptance and the tendency to accept the use of Google Classroom among Form Six economics students. In essence, the level of acceptance of Google Classroom-assisted learning among economics students was good. Additional findings also verified the propensity of economics students to embrace Google Classroom based on demographic factors. The factors of residential location and family income did not reflect differences among groups in their tendency to accept the use of Google Classroom. This finding is in line with the view of Vygotsky (1978) that learning occurs when individuals actively interact socially.

6. Recommendations

The findings of this research could help educators to consider using Google Classroom as a medium for facilitating economics learning. Teachers could choose a user-friendly digital medium based on students' preferences. In addition, the findings could help school administrators better understand how effective the use of Google Classroom is according to students. The study has proven that teachers and students need to be prepared with mastery of futuristic pedagogical methods such as cybersecurity, gamification, and heutagogy. This study is important for students, teachers, school administrators, and information technology officers in the field of education. Teachers need to be reactive to learning style needs and pinpoint techniques germane to students' current needs. The school management and technology officers of the Department of Education should inspire teachers to integrate technology in classroom teaching and conduct in-service technology-literacy training in collaboration with community colleges from time to time. In addition, the government also needs to furnish support for learning facilities, primarily to rural and low-income students, to address the needs related to mobile devices and sound internet access.

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Appendix 1

Performance Expectancy
E1 Google Classroom can help me learn economics.
E2 Google Classroom-assisted learning can be done anywhere at any time.
E3 Google Classroom helps me find information through the internet.
E4 Google Classroom helps me learn in groups.
Effort Expectancy
E5 Google Classroom makes it easy for me to interact with friends.
E6 The skills in using devices make me proficient in using Google Classroom.
E7 The experience of using device tools makes it easy for me to use Google Classroom in learning.
Social Influence
E8 Friends influence me to use Google Classroom.
E9 The school encourage the use of Google Classroom in learning.
E10 Economics teacher often helps me use Google Classroom.
Facilitating Conditions
E11 I have the appropriate device to use the Google Classroom application.
E12 I have the knowledge to use Google Classroom.
E13 My friend is willing to help if I need help in using Google Classroom.