

Online Flipped Google Classroom: An Assistive Tool in English Language Learning

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Abstract—This study investigated the advantages of using an online flipped Google Classroom to learn English grammar. The design of teaching and learning activities was guided by the 5E framework proposed by Bybee et al. (2006). Fifty-six pre-service teachers from an institute of teacher education participated in the study. The study utilised a mixed-methods design, which included a survey and reflective writing. The quantitative analysis demonstrated students' satisfaction with the Online Flipped Google Classroom and deemed it an appropriate platform for acquiring knowledge of English grammar. The qualitative analysis provided additional context for the quantitative findings by exposing positive and negative experiences. A pedagogical approach proposed by the study could equip educators and students with the necessary skills to navigate unforeseen circumstances, such as pandemics or other crises, wherein conventional classroom lectures may prove impracticable.

Index Terms—flipped classroom, Google Classroom, online learning, pre-service teachers, higher education

I. INTRODUCTION

The integration of technology into the curriculum of pre-service teachers has acquired considerable attention, as evidenced by the investigations of several scholars (Teo et al., 2019). Due to their technology-rich upbringing, young pre-service teachers are frequently regarded as ideal candidates for effectively implementing ICT in teaching and learning (Gill & Dalgarnob, 2017). On the contrary, reports indicate that many pre-service teachers lack confidence in their capacity to proficiently employ ICT tools (Farjon et al., 2019). In order to identify effective learning practices for pre-service teachers, this study proposes an active learning approach for organising teaching-learning activities in English grammar that focuses specifically on the flipped classroom. This study examined pre-service teachers' experiences in learning English grammar through the integration of the flipped classroom approach, the Google Classroom platform, and Bybee et al.'s (2006) 5E framework. The platform used in this study termed as the Online Flipped Google Classroom.

By gaining insights into pre-service teachers' perceptions and experiences, the research can enhance the effectiveness of the Online Flipped Google Classroom and promote its sustainability. There needs to be more evidence of good practice and approaches available for the transition to a solely online flipped classroom approach.

The following are the research inquiries that underpin this study:

1. How do pre-service English language teachers perceive the Online Flipped Google Classroom?
2. What are the overall experiences of pre-service English language teachers with the Online flipped Google Classroom?

The following section illustrates the integration of the flipped classroom approach and Google Classroom. The two educational approaches converge to enhance the learning experience for pre-service teachers.

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II. LITERATURE REVIEW

A. *Online Flipped Google Classroom*

A flipped classroom incorporates learning and teaching activities outside the school in a traditional classroom setting (Lag & Saele, 2019). The proliferation of flipped learning has been facilitated by the advancement of technological instruments, such as video-gathering programmes and interactive videos (Nja, 2022). Advocates of the flipped classroom model argue that it enhances the rapport between instructors and pupils (Shana et al., 2021), fosters the development of critical thinking abilities (Brinks, 2014), assists students in recognising their learning styles and alternatives, and promotes active participation in the educational journey (Lag & Saele, 2019; McLean et al., 2016).

The flipped classroom's capacity to foster collaborative learning, reduce student tension, and grant students greater autonomy over their education (Strayer, 2012). In general, higher education institutions may find the implementation of flipped classrooms to be a beneficial strategy to accommodate the evolving paradigms of student learning and provide efficient online teaching and learning experiences. The number of scholarly articles examining the implementation of flipped classrooms in an educational setting has increased exponentially (Murillo-Zamorano et al., 2019; Sailer & Sailer, 2020; Yilmaz & Yilmaz, 2023; Zhu et al., 2023; Lag & Saele, 2019). On the other hand, Google Classroom is an increasingly popular and cost-free web-based learning management system. It permits interaction and collaboration with other web-based applications, including Google Drive, Google Meet, and Google Calendar, from within it. It facilitates the management and submission of assignments by instructors in a paperless setting through the utilisation of Google Apps, including Google Drive, Google Docs, and Google Meet. Google Classroom is utilised for the following reasons: it is mobile-friendly, cost-free, and hosted in the cloud. Instructors can upload assignments, videos, and materials; students can work in groups. Using Google Classroom also enhances problem-solving and higher-order thinking skills (Shaharane et al., 2016). In this regard, Google Classroom facilitates teaching and learning activities.

Several studies (Al-Marouf & Al-Emran, 2018; Azhar & Iqbal, 2018; Gupta & Pathania, 2020; Farah et al., 2021; Aloutomi, 2022) have provided evidence of the favourable effects that Google Classroom has had across various educational environments, influencing the perceptions and experiences of users. However, further empirical research is required to determine effective approaches for integrating Google Classroom into the instruction and learning of the English language. The present investigation aims to bridge the research gap by integrating the Bybee et al.'s (2006) 5E framework.

Furthermore, to the best of the researchers' knowledge, no known research has been conducted on user adoption of the Google Classroom platform in an English-as-a-second language (ESL) context in Malaysia. Learners' decisions to remain or discontinue their early experience will strongly influence flipping (Simonson, 2017; Xu et al., 2021) rather than by scientifically validated principles (Lo & Hew, 2017). Thus, the present study has integrated Google Classroom with the 5E framework.

The phrases of the 5E framework are:

Engagement: This student-centred phase aims to engage the student and create a desire to learn more by engaging students to think critically and connect to past experiences.

Exploration: This phase promotes a mental focus on the concept. This phase provides the learners with a concrete learning experience. This phase is also student-centered and incorporates active learning.

Explanation: This is more instructor-directed and guided to the students by considering their prior knowledge to facilitate concept building.

Elaboration: The activities in this phase encourage students to apply their new ideas and concepts while reinforcing new skills.

Evaluation: Assessment in an inquiry-based setting to evaluate students' mastery. For example, quizzes.

B. *Technology Acceptance Model*

The subsequent section delves into the Technology Acceptance Model utilised as a guide for this research. Subsequently, a systematic review is conducted on both Google Classroom and the flipped classroom approach.

The Technology Acceptance Model (TAM) framework has supported a multitude of studies related to the acceptance of technology and was first introduced by Davis (1985) based on the theory of reasoned action and the theory of planned behaviour (Weng et al., 2018). TAM is also widely used to investigate behavioural intention, followed by the actual action (Davis, 1989). According to TAM, users' acceptance of a tool or a system depends on two main perceived usefulness determinants: ease of use, attitude and behavioural intention. The TAM developed by Davis and colleagues (Davis et al., 1989) was adopted in this study. The original Technology Acceptance Model (TAM) consisted of four constructs: perceived ease of use, perceived usefulness, attitude towards use, and behavioural intention. The researchers chose to use TAM since it is a more straightforward and manageable model with sufficient explanatory power. TAM may provide sufficient explanatory power and meet the study's specific needs without requiring the inclusion of additional constructs introduced in Extended TAM or UTAUT. TAM focuses on users' perceptions and attitudes towards technology, allowing educators to understand how students perceive and accept the Online Flipped Google Classroom.

This study introduces two additional constructs Huang et al. (2011) proposed- i.e., system and material characteristics. While focusing on technological systems within a given context, the characteristics of a system emphasise their defining qualities. Material Characteristics underline attributes related to form elements, such as its overall physical appearance and design principles used in the creation process- all contributing to aesthetic appeal. By integrating system and material characteristics into the TAM model, researchers aim to capture a broader range of factors that influence users' acceptance and adoption of technology, in addition to the traditional emphasis on perceived usefulness and ease of use.

Overall, TAM is a widely recognised framework that focuses on understanding how individuals perceive and experience technology. Overall, its fundamental components, like the perceived ease of use and perceived usefulness, are closely linked to how people perceive and experience technology. By adopting a user-centred perspective and considering the practical implications of technology acceptance, TAM can effectively address pre-service teachers' perceptions and experiences in the context of pre-service language teachers. Exploring both perceptions and experiences allows the authors to capture a holistic understanding of pre-service teachers' interaction with technology.

III. METHODOLOGY

This study employed an explanatory mixed-method study. The model facilitates the accumulation and analysis of quantitative and qualitative data, providing a comprehensive and intricate depiction of the practical situation under investigation (Creswell & Clark, 2018). By doing so, they can examine the research issue from multiple perspectives, considering not only quantitative data but also the circumstances, interpretations, and lived realities of the participants or organisations. The objective is to attain a more comprehensive comprehension of the subject matter being examined.

A. Participants

This study was carried out by Teaching English as a Second Language (TESL) pre-service teachers in a teacher education institute in Malaysia. The participants were selected using convenience sampling, which permitted the researchers to select them based on their accessibility and proximity (Creswell & Garrett, 2008). A total of 56 pre-service teachers were selected to answer the questionnaire. Malaysia is a multiracial country, with students representing various ethnic backgrounds, including Malay (22), Chinese (12), and Indian (11). They were fresh graduates of Sijil Pelajaran Malaysia (public examination) and had just entered the teacher education institute for semester one. They had never used Google Classroom before entering the teacher training college. The Language Description course enhances TESL pre-service teachers' knowledge and competence in the forms, meanings, and use of various grammatical aspects of the English language. The objective is to enable students to use the language in varied discourse settings accurately and appropriately.

At the end of this course, pre-service teachers were able to:

1. demonstrate an understanding of grammatical items and structures in various contexts.
2. apply correct grammatical rules in a variety of contexts.
3. analyse grammatical items, structures and errors in language use.
4. use grammatical items and structures accurately and appropriately in various contexts.

Before the study, participants were briefed on the nature of the research, and confidentiality was assured. They were also given pseudonyms.

B. Research Procedure

Google Classroom was used as the online learning platform for student and instructor interaction. It could be accessed through Android and iOS operating systems, as well as through the desktop. The pre-service teachers read the assigned chapters/notes, watched instructional video presentations, and completed the online interactive exercises (with answers uploaded by the lecturer.) Each participant then completed tasks for tutorial classes during online synchronous classes. The instructor provided timely and constructive verbal or written feedback to students' tasks submitted to Online Flipped Google Classroom. The flipped classrooms lasted for eight weeks, one week for each topic. The topics covered are Word Classes, Tenses, Subject Verb Agreement, Sentence Types, Moods, Phrases and clauses, Sentence Patterns, Reported Structures and Cohesive Devices.

C. Instrument and Data Analysis

For the mixed-methods study, a questionnaire was developed using Google Forms and its URL link was shared with all TESL students. The items in the questionnaire employed a five-point Likert scale. Two experts in education technology and the English language reviewed the instrument to improve its face validity. The questionnaire in this study consisted of three sections. Section A solicited demographic information of the pre-service teachers, i.e., age and gender. Meanwhile, Section B was about the perceptions of students of Google Classroom. The questionnaire adapted TAM's constructs, mainly perceived ease of use, perceived usefulness, attitude and behavioural intention. Further, two more constructs were adapted from Huang et al. (2011). They are system characteristics and material characteristics.

The construct consists of system characteristics (seven items), material characteristics (six items), ease of use (seven items), perceived usefulness (six items), attitude (four items) and behavioural intention (four items). Statistical analysis was carried out using IBM SPSS Statistics Version 27.0. The researchers employed descriptive statistics to examine participants' responses. The reliability of the questionnaire was measured by Cronbach's coefficient alpha for each

construct with an acceptable internal consistency of .81. The students completed the questionnaire on the 8th week after completing their lessons. After the data from the questionnaire were analysed, an email was sent to all the participants who had completed the survey, and the researchers enquired if they would be interested in reflective writing to understand their practices, reasons, and challenges further. More than half of the samples agreed, but only 20 participants were selected to keep the amount of data manageable.

The pre-service teachers were asked to reflect on their overall experiences with online flipped in the 10th week. This reflection aimed to understand pre-service teachers' ability to 1) evaluate the teaching and learning activities, 2) understand their thoughts in teaching and learning activities during the Online Flipped Google Classroom, and 3) comprehend the emotional and intellectual challenges.

Braun and Clarke's (2006) six-step thematic analysis guide the categorisation of reflections. The steps are familiarisation with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. Deductive analysis was employed in our qualitative research. Braun and Clarke's (2006) five-step thematic analysis guided the interview data analysis.

Step 1: Familiarity with the data. A coder reviewed and reread the transcripts line by line. This stage entails complete engagement with the data, a comprehensive review, and multiple readings of transcripts, examining each line meticulously. The objective is to develop a profound comprehension of the material.

Step 2: Creating initial codes. The assistant coded transcripts to indicate important content and annotated them.

Step 3: Identifying themes. All annotated transcripts were thoroughly examined by the main author, who looked for any discrepancies in interpretation. The authors resolved any discrepancies in interpretation. They examined the codes to produce preliminary themes.

Step 4: Reviewing themes. The team may combine specific current themes or break some themes down into subthemes. The team iterated this approach until the thematic map met their expectations.

IV. RESULTS

The following section presents the survey findings, addressing Research Question 1 through quantitative data analysis. These findings are then integrated with the insights from Research Question 2, which involves qualitative data analysis (reflection). This amalgamation allows for comprehensively comprehending the research question by comparing and combining the findings. Table 2 indicates the pre-service teachers' overall perception of the Google Classroom in the course. Most of the items' scores are at the upper intermediate level of agreement. Among the six constructs, material characteristics have the highest mean ($M = 4.55$), followed by behavioural ($M = 4.30$), attitude ($M = 4.23$), usefulness ($M = 4.22$), perceived ease of use ($M = 4.08$) and system characteristic ($M = 3.97$). Table 3 illustrates the mean scores for each construct. The pre-service teachers' reflections were analysed based on six closely related dimensions: systematic characteristics, material characteristics, ease of use, usefulness, behavioral intention, and attitude. The emerging themes were related to challenges. The reflection was presented after the descriptive statistics to facilitate triangulation.

TABLE 1
MEAN AND STD FOR EACH ITEM OF ONLINE FLIPPED GOOGLE CLASSROOM

Constructs	Mean	STD	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
System Characteristic							
Using Online Flipped Google Classroom provided me with English language grammar learning activities in a traditional classroom environment.	3.8	.79	0	1.9	34	41.5	22.6
Using Online Flipped Google Classroom provided a stimulating English language grammar learning environment.	4.0	.69	0	1.9	17	58.5	22.6
Using an online flipped Google classroom enabled me to interact more effectively with my lecturer and learn English language grammar.	3.8	.93	0	11.3	15.1	47.2	26.4
Using Online Flipped Google Classroom enabled me to interact effectively with my peers and learn English grammar.	3.7	.93	0	11.3	22.6	43.4	22.6
I felt more comfortable using Online Flipped Google Classroom to comment on the task my peers produced, compared to traditional classroom teaching.	3.9	.79	1.9	1.9	15.1	58.5	22.6
I could use Online Flipped Google Classroom to enhance my English grammar learning based on the comments and suggestions made by my lecturer.	4.2	.71	0	1.9	11.3	50.9	35.8
I was able to use Online Flipped Google Classroom to sharpen my English grammar learning based on the comments and suggestions made by my peers.	4.0	.75	0	1.9	18.9	49.1	30.2
Material Characteristic							
The video/audio material uploaded by the lecturer helped me to immerse myself in the English grammar learning atmosphere of the class.	4.5	.53	0	0	1.9	39.6	58.5

Constructs	Mean	STD	Strongly Disagree (%)	Disagree (%)	Neutral (%)	Agree (%)	Strongly Agree (%)
The video/audio material uploaded by the lecturer helped me to immerse myself in the English grammar learning atmosphere of the class.	4.4	.60	0	0	5.7	39.6	54.7
The video/audio materials uploaded by the lecturer helped me to understand the grammatical rules.	4.6	.56	0	0	3.8	32.1	64.2
The video/audio materials uploaded by the lecturer were useful to improve my English grammar.	4.5	.60	0	0	5.7	35.8	58.5
The online interactive quizzes created by the lecturer were very interesting.	4.5	.66	0	0	9.4	28.3	62.3
The interactive online quizzes created by the lecturer were useful in improving my English grammar.	4.5	.60	0	0	5.7	30.2	64.2
Perceived Ease of Use							
I received clear guidance about my task for English language grammar learning via Online Flipped Google Classroom	4.2	.71	0	0	15.1	41.5	43.4
Using Online Flipped Google Classroom did not require too much time.	3.9	.82	0	1.9	28.3	39.6	30.2
Learning to use Online Flipped Google Classroom for my class during the English language grammar activities was easy.	4.2	.80	0	1.9	17	37.7	43.4
Interacting with my lecturers via Online Flipped Google Classroom for English language grammar learning was convenient.	4.0	.83	0	5.7	13.2	47.2	34
Interacting with my peers via Online Flipped Google Classroom for English language grammar learning was convenient.	3.9	.88	0	5.7	22.6	39.6	32.1
Interacting with my lecturer via Google Classroom for English grammar learning was not stressful.	4.0	.85	0	5.7	18.9	45.3	30.2
Interacting with my peers via Online Flipped Google Classroom for English language grammar learning was not stressful.	4.0	.91	0	5.7	24.5	34	35.8
Perceived Usefulness							
Learning through Online Flipped Google Classroom improved my English language grammar ability.	4.1	.60	0	1.9	5.7	67.9	24.5
Learning through Online Flipped Google Classroom enhanced my desire to use English grammar effectively.	4.1	.73	0	0	18.9	43.4	37.7
Learning through Online Flipped Google Classroom provided a beneficial outcome to this class.	4.2	.64	0	0	11.3	52.8	35.8
The comments and suggestions made by my lecturer through Online Flipped Google Classroom were helpful in improving my English language grammar.	4.4	.60	0	0	5.7	45.3	49.1
The comments and suggestions made by my lecturer through Online Flipped Google Classroom were helpful in improving my English language grammar.	4.2	.66	0	0	13.2	52.8	34
Learning through Online Flipped Google Classroom strengthened my critical thinking as I got to comment on the work of my peers.	4.1	.80	0	1.9	20.8	41.5	35.8
Attitude							
I liked using Online Flipped Google Classroom to learn English grammar.	4.1	.72	1.9		7.5	60.4	30.2
I have a positive attitude about using Online Flipped Google Classroom in learning English in this class.	4.3	.66	0	1.9	5.7	52.8	39.6
I looked forward to using Online Flipped Google Classroom in English language learning in this class.	4.2	.71	0	1.9	11.3	50.9	35.8
Behavioral							
I will create activities on English language learning in Online Flipped Google Classroom to improve my pupils' English grammar.	4.3	.65	0	0	9.4	45.3	45.3
If I have access to Online Flipped Google Classroom, I will be happy to use it for English language learning.	4.3	.69	0	1.9	7.5	49.1	41.5
When I Online Flipped Google Classroom, I will have confidence when I participate in conversations in English.	4.1	.59	0	0	9.4	62.3	28.3
I will use Online Flipped Google Classroom to teach my pupils in the future.	4.3	.71	1.9	0	1.9	50.9	45.3

TABLE 2
MEAN AND STD FOR THE ONLINE FLIPPED GOOGLE CLASSROOM CONSTRUCTS

Constructs	Mean	STD	Number of items
System characteristics	3.97	0.66	7
Material characteristics	4.55	0.52	6
Perceived usefulness	4.22	0.56	6
Perceived ease of use	4.08	0.69	7
Attitude about usefulness	4.23	0.64	3
Behavioural Intention	4.30	0.55	4

A. System Characteristics

The results for the system characteristics construct indicate that the item *"I can enhance my English grammar learning based on the comments made by the lecturer"* with the highest (mean score 4.208, STD 0.7168) and lowest for item *'using Google Classroom enables me to interact effectively with my peers to learn English language grammar'* (mean score 3.774, STD 0.9332). The reflection on system characteristics revealed that interactions with educators and peers enhanced English grammar learning via online flipped Google Classroom. For PS10, the *"materials and interaction with teachers are beneficial and help improve English grammar"* (RPS5). PS20 expressed her satisfaction and highlighted that the online flipped Google Classroom is *"a good platform to contact/connect with lecturers and able to access tutorials whenever we can"*. PS15 said, *"My classmates will interact if there is any doubt regarding the lesson. By learning Language Description via Google Classroom, the result will end up in a good understanding where students can solve their doubts from time to time"*. Students admitted that *"earlier I thought it would be difficult if we learn grammar online without notes. However, once I started teaching via online flipped Google Classroom. I could understand better because of the lecturers' techniques, like using videos, infographics, quizzes, games and many more. I would like to thank Madam X for her creativity."* Most participants emphasised that they had improved their grammar knowledge (RPS7, RPS17, RPS9) during the online flipped experience. The online flipped experience inspired them to enhance their knowledge further. One student confessed that *"with the notes and information available in online flipped Google classroom, I can analyse my grammatical error in my text, and I am more committed to learning English grammar after being exposed to learning grammar in a variety of creative and logical way"* (RPS13). RPS13 said that *"online flipped experience enhanced grammar knowledge because we were not bored."*

B. Material Characteristics

For the construct related to material characteristics, all the items showed a median score of more than 4. The findings indicate that the materials, videos, and quizzes uploaded by the lecturer were recognised as useful, with the highest median and lowest median for *"learning through online flipped Google Classroom strengthen my critical thinking as I get to comment on work of my peers."* In terms of material characteristics, the reflection demonstrated that videos, quizzes and games helped students understand grammar concepts. The online flipped Google Classroom has allowed students to be more *"independent and explore new things or new mediums"* (RPS10). In the online flipped Google exercises according to their free time" (RPS 5).

C. Ease of Use

The participants' responses to the construct related to 'ease of use' showed a score for upper intermediate agreement. The lowest median is for items related to *'using Google Classroom did not require too much time'* (median 3.9, STD. 82) and *"interacting with my peers via Google Classroom for English language grammar learning was convenient"* (median 3.9, STD. .88). The highest median for items related to *"I received clear guidance about my task for English language grammar learning via Google Classroom"* (median 4.2, STD.71) and *"learning to use Google Classroom for my class during the English language grammar activities was easy"* (median 4.2, STD.80). The subthemes that emerged for variable ease of use are easy-to-access and flexible platforms. Most of the students found that the online flipped Google Classroom was a *"convenient platform"* (RPS7, RPS9, RPS16, RPS17) for English language grammar learning and it *"gave a new experience"* (PS11). The students opined that the uploaded materials allowed *"easy access to materials from Google Classroom"* (RPS17), *"easy to get new information about the course"* (RPS3), and these materials guide *"the students throughout the learning process."* (RPS5). Furthermore, *"with the use of Google classroom notes are arranged"* (RPS8) and it is *"fast and easy"*.

D. Usefulness

The perceived useful construct shows higher intermediate agreement with a median of more than 4, revealing the Google Classroom English language grammar idea. The highest median was (mean 4.4, STD,60) for *"the comments and suggestions made by my lecturer through Google Classroom were useful for improving my English grammar."* The lowest median is for *"learning through Google Classroom improved my English language grammar ability"* (mean 4.1, STD .60), *"learning through Google Classroom enhanced my desire to use English language grammar effectively"* (mean 4.1, STD .73), and *"learning through Google Classroom strengthened my critical thinking as I get to comment on my peers work"* (median 4.1, STD.80). RPS16 detailed that *"students sometimes need help fully focusing on every class, especially when there is no break in between, or need help understanding the classes. Therefore, the materials uploaded by the instructor in the online flipped Google classroom allow students to play the video and pre-recorded classes for a better understanding"* (RPS40).

In addition to that, *"online flipped Google Classroom helps students always to be updated with their tutorials and assignments by educator reminding them of the deadline and not to procrastinate the work"* (RPS19) and therefore online flipped Google Classroom allowed *"information to be conveyed easier"* (RPS15) and *"submit assignments"* (RPS5, RPS7, RPS9). It *"saves time and energy"* (RPS2, RPS4, RPS7, RPS28), and we were able to *"understand better"* (RPS4, PS6, P20). As a result, learning English is *"less stressful"* (RPS3) and *"interesting and exciting"* (RPS 4, RPS8). RPS7 concluded that *"learning English is fun using the Google Classroom"*.

E. Attitude

For the construct related to attitude, the participants had positive attitudes toward the use of Google Classroom. The themes that *emerged* were related to students appearing more confident. Students appeared to be more “*confident*” (RPS1, RPS12, RPS10) and “*relaxed*” (RPS4). This is because they “*can ask questions without feeling shy compared to face-to-face physical class,*” and they are “*more confident learning grammar through this Google classroom*” (RPS1). RPS8 said, “*I am bolder in posing questions in Google Classroom, which helps me understand my grammatical errors.*” Activities such as “*videos and quizzes make us excited and energetic*” (RPS2). The online flipped Google Classroom allows them to understand what they will learn. RPS1 explained that “*when there is a Google Meet, the students get the idea of what they have learned and “make notes with the material before class*” (RPS6). Hence, it was no surprise that students felt that “*it was a good platform for an introvert to develop themselves*” (RPS 12).

Students repeatedly acknowledged the fact that the activities on the platform were enjoyable. The participants wrote that learning with online flipped Google Classroom, they “*have done lots of fun things, making the learning process exciting and fun. The online flipped Google Classroom made the learning went well and more effective since students tend to use technologies*” (RPS1). Students elaborated on their positive feelings and gave examples of how they enjoyed the online flipped Google Classroom activities. For example, “*I really enjoyed the task where I had to listen to the song by Justin Bieber, to learn about three different sentence types, Simple Tense, Compound Sentence, and Complex Sentence*” (RPS 14). This was the teachers’ pedagogy structure for students to “*sing and dance to learn new sentence patterns and to forget the bad things that we are going through*” (RPS13) and “*enjoy their learning journey*” (RPS7) so that the classes are “*not boring*” (RPS13). Students concluded that learning through online flipped Google Classroom:

is very interesting as we can have fun while learning. As a future teacher, I will use this kind of learning method as it can help my students have fun while learning and get good results, as I have experienced (RPS 12).

F. Behavioural Intention

Since pre-service teachers were directly involved in completing their tasks, they realised that as future teachers, they gain “*some ideas of presenting and implementing lessons to the children. For instance, videos related to my lessons as school children love to watch animation videos. By doing so we will be able to conduct my lessons effectively*” (RPS5). The participants have begun thinking of their teaching in the future. RPS7 said that she will “*use online flipped Google Classroom with her students in the near future.*” because students can “*be motivated and have fun while learning.*” The online flipped Google Classroom has made participants consider the type of educators they want to be in the future. RPS3 admitted that the “*learning process became more interesting than the physical classes as sometimes the lecturer provided a learning video for us to watch. As a future teacher, I think I would consider online classes for my students.*” The intention to be an effective in-service teacher after their online flipped Google Classroom is evident when RPS11 explained that:

As a future teacher, I want to become a good and dedicated teacher and, teach my students with a lot of effort and be able to produce a generation fluent in English. It has awakened their determination to become better educators and recognised the characteristics of an effective teacher as an integral part of their future professional endeavour.

RPS18 detailed that:

As a future teacher, I would like to apply all the new ways of learning that I have experienced to students to make online learning easier and more convenient. I am sure I will make studying fun by leveraging all the experience I have acquired from online flipped Google Classroom.

G. Challenges

Although the online flipped Google Classroom has opened possibilities for students to engage with learning, problems and issues sometimes arise. The main issue highlighted by participants was the “*Internet connection*” (RPS4, RPS6, RPS7, RPS13, RPS18). They realised that “*online flipped Google Classroom will require stable and strong wifi and we need good Internet speed*” (RPS3). Students expressed their dissatisfaction when “*they can’t directly interact with lecturers when the connection is bad*” (RPS8). Similarly, reflective writing indicates that learning is problematic “*when there is no access to the Internet*” (RPS8). A student also showed that having an online flipped Google Classroom is not “*good for eyes and health as we need to sit in front of our laptops for a very long time and it will hurt our eyes*” (RPS6). One student was unhappy with the online flipped Google Classroom since it “*drains our energy because looking at the laptop just makes it worse*” (RPS15). Similar dissatisfaction was also evident in their reflective writing. RPS5 opined that:

lecturers may have to record their explanation as typing can be tiring and if students ask questions, it may be hard for lecturers to explain as they do not meet in person.

V. DISCUSSION

Based on research findings, online flipped Google Classroom supports a shift from traditional face-to-face instruction to online teaching across all stages of the education process- preparation, delivery and follow-up- facilitating productive

virtual teaching outcomes. Participants reported positively on system characteristics like materiality embodiment ease-of-use criteria, which enhanced their overall experience with English grammar classes taught through this model, validating it as a worthy instructional approach aligned with principles connected with flipped classrooms (Basal, 2015), reinforcing proofs noted by other scholars (Jun et al., 2017; Yang, 2017). The outcomes also affirm the benefits perceived from the instructor's coaching function in a virtual environment. Online flipped Google Classroom can be effective even in tragic scenarios where physical classrooms are inaccessible. By offering an engaging and realistic environment that stimulates interaction among learners while also improving their grammar skills, the characteristics of the online flipped Google Classroom system that learners appreciated align with previous research that illustrates how satisfied learners lead to successful learning outcomes (Haghighi et al., 2019). Therefore, utilising the online flipped Google Classroom as part of English language grammar teaching has the potential to enhance instruction and make learning more enjoyable. Engaging in active learning can significantly improve students' communication and cognitive skills. Ushioda (2013) notes that students (in this study, it refers to the pre-service teachers) must exercise agency in discovering and utilising online resources, which helps boost their motivation. Students who undertake active learning find themselves able to take charge of their learning, exercise control over time and space and enhance the possibilities of personalised learning. They also benefit from reflective thinking, reducing stress levels and less frustration.

In particular, students relished the freedom to choose what they wanted to learn, where they wanted to learn from, and how they wanted to learn. The findings of this study validate previous research, which noted that learners are more disciplined, independent, and autonomous when engaged in learning outside the classroom (Amiryousefi, 2017). Kang (2015) argues that flipped classrooms facilitate effective student interaction while achieving multiple learning goals. According to Liyange et al. (2012), students' preference for learning activities increases when teachers do not control the process outside the classroom. Other studies have shown that perceived usefulness and perceived ease of use are crucial factors influencing technology acceptance among learners (Davis, 1989; Annamalai et al., 2021). In this study, participants found online flipped Google Classroom activities enjoyable while boosting their confidence levels. Furthermore, pre-service teachers admitted that online flipped Google Classroom was worthwhile as a platform for language grammar learning. While it is clear that online flipped Google Classroom has significant advantages over traditional classroom methods of teaching language grammar, safeguard mechanisms need consideration due to issues surrounding stability issues with internet access or other challenges related to the online environment associated with health risks like eye problems thus emergency alternative Plan B should be set aside when dealing with these concerns. Therefore, teacher training institutions must embrace technology to educate and work towards developing innovative ways through practical courses such as designing digital platforms, thus helping pre-service teachers become digital practitioners.

VI. CONCLUSION

This study sheds light on designing and implementing effective online flipped Google Classroom instruction in English grammar. While additional rigorous research is needed to overcome limitations and provide comprehensive evidence on the efficiency of online flipped Google Classroom, educators can utilise this study's insights when developing inspiring learning opportunities for students. Educators must balance the positive elements identified in this investigation with potential drawbacks when implementing an online flipped Google classroom-based curriculum so that it promotes meaningful learning experiences. The research on online, blended learning in English language instruction contributes to the existing body of knowledge in several ways. It provides a deeper comprehension of the efficacy, benefits, and difficulties of implementing online blended learning approaches in English language instruction. This study contributes significantly to the literature on online flipped classrooms in three main ways. Firstly, it explains how English grammar can be designed using the 5E framework and effectively converted from a traditional flipped classroom to an online format. The 5E framework proposed by Bybee et al. (2006) proves valuable in guiding instructors who want to create and implement online flipped classrooms. Secondly, the study identifies positive emerging themes that can guide instructors considering adopting online flipped classrooms. These themes include easy access, convenient platform, sharing of materials, content and teacher-student interaction, personalised learning, fun and enjoyment, confidence building, and professional development. Educators must consider these positive elements to enhance learners' meaningful and practical experiences in using online flipped classrooms while also being mindful of the limitations and drawbacks mentioned by the study participants.

It may contribute to the existing literature by investigating previously unexplored aspects or contexts of online blended learning in English language instruction in the Malaysian setting. The research contributes to the field by expanding knowledge, informing practice, and directing future research in online blended learning in English language instruction. This small-scale mixed-method case study allows researchers to comprehend the intricacies and complexities of the subject being investigated. However, several limitations of the study must also be acknowledged. The sample size of participants is relatively small and may not be representative of other contexts or settings. To enhance the comprehensiveness of study outcomes, future research must prioritise sampling more expansive and diverse participant populations. Furthermore, it might be not easy to fully appraise online flipped Google Classroom's long-term effectiveness within just an 11-week time frame. Therefore, a recommended approach entails conducting online flipped

Google Classroom for more extended periods, enabling evaluation of its resilience while supporting sustained learning results.

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REFERENCES

- [1] Amiryousefi, M. (2019). The incorporation of flipped learning into conventional classes to enhance EFL learners' L2 speaking, L2 listening, and engagement. *Innovation in Language Learning and Teaching*, 13(2), 147–161. <https://doi.org/10.1080/17501229.2017.1394307>
- [2] Azhar, K. A., & Iqbal, N. (2018). Effectiveness of Google classroom: Teachers' perceptions. *Prizren Social Science Journal*, 2(2), 1-66.
- [3] Al-Marouf, R. A. S., & Al-Emran, M. (2018). Students Acceptance of Google Classroom: An Exploratory Study using PLS-SEM Approach. *International Journal of Emerging Technologies in Learning*, 13(6). <https://doi.org/10.3991/ijet.v13i06.8575>
- [4] Amiryousefi, M. (2017). The differential effects of collaborative vs. individual prewriting planning on computer-mediated L2 writing: Transferability of task-based linguistic skills in focus. *Computer Assisted Language Learning*, 30(8), 766-786. <https://doi.org/10.1080/09588221.2017.1328531>
- [5] Alotumi, M. (2020). EFL learning beyond the wall with MALL: College students' perceptions. In R. Ahmed, A. Al-kadi, & T. Hagar (Eds.), *Enhancements and limitations to ICT-based informal language learning: Emerging research and opportunities* (pp. 138–160). IGI Global. <https://doi.org/10.4018/978-1-7998-2116-8.ch00>
- [6] Annamalai, N., Ramayah, T., Kumar, J. A., & Osman, S. (2021). Investigating the use of learning management system (lms) for distance education in Malaysia: A mixed-method approach. *Contemporary Educational Technology*, 13(3), ep313. <https://doi.org/10.30935/cedtech/10987>
- [7] Basal, A. (2015). The implementation of a flipped classroom in foreign language teaching. *Turkish Online Journal of Distance Education*, 16(4), 28-37. <https://doi.org/10.17718/tojde.42965>
- [8] Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- [9] Brinks Lockwood, R. (2014). *Flip it! Strategies for the ESL classroom*. Ann Arbor, MI: University of Michigan Press.
- [10] Bybee, R. W., Taylor, J. A., Gardner, A., Van Scotter, P., Powell, J. C., Westbrook, A., & Landes, N. (2006). The BSCS 5E instructional model: Origins and effectiveness. *Colorado Springs, Co: BSCS*, 5, 88-98. DOI: <https://doi.org/10.1187/cbe.05-12-0168>
- [11] Creswell, J. W., & Garrett, A. L. (2008). The “movement” of mixed-methods research and the role of educators. *South African journal of education*, 28(3), 321-333. DOI: <https://doi.org/10.15700/saje.v28n3a220>
- [12] Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications. DOI: <https://doi.org/10.4135/9781506386685>
- [13] Davis, F. (1985). *Technology acceptance model for empirically testing new end-user information systems: Theory and results*. Unpublished doctoral dissertation, Massachusetts Institute of Technology, Cambridge.
- [14] Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, 35(8), 982–1003. DOI: <https://doi.org/10.1287/mnsc.35.8.982>
- [15] Farah, Z., Mohamad, F., Napitupulu, D., Nazuar, S., & Roza, L. (2021). Analysing Indonesian students' Google Classroom acceptance during COVID-19 outbreak: Applying an extended unified theory of acceptance and use of technology model. *European Journal of Educational Research*, 10(4), 1697–1710. DOI: <https://doi.org/10.12973/eu-jer.10.4.1697>
- [16] Farjon, D., Smits, A., & Voogt, J. (2019). Technology integration of pre-service teachers explained by attitudes and beliefs, competency, access, and experience. *Computers & Education*, 130, 81-93. <https://doi.org/10.1016/j.compedu.2018.11.010>
- [17] Gill, L., & Dalgarno, B. (2017). A qualitative analysis of pre-service primary school teachers' TPACK development over the four years of their teacher preparation programme. *Technology, Pedagogy and Education*, 26(4), 439-456. <https://doi.org/10.1080/1475939X.2017.1287124>
- [18] Gupta, A., & Pathania, P. (2021). To study the impact of Google Classroom as a platform of learning and collaboration at the teacher education level. *Education and Information Technologies*, 26(1), 843-857. <https://doi.org/10.1007/s10639-020-10398-x>
- [19] Haghghi, H., Jafarigohar, M., Khoshsima, H., & Vahdany, F. (2019). Impact of flipped classroom on EFL learners' appropriate use of refusal: achievement, participation, perception. *Computer Assisted Language Learning*, 32(3), 261-293. <https://doi.org/10.1080/09588221.2018.1444209>
- [20] Huang, Y.M., Huang, Y.M., Huang, S.H., & Lin, Y.T. (2011). A ubiquitous English vocabulary learning system: Evidence of active/passive attitudes vs. usefulness/ease-of-use. *Computers & Education*, 58(1), 273-282. <https://doi.org/10.1016/j.compedu.2011.08.008>
- [21] Jun Scott Chen Hsieh., Wen-Chi Vivian Wu., & Michael W. Marek. (2017). Using the flipped classroom to enhance EFL learning. *Computer Assisted Language Learning*, 30(1), 1-21, DOI: <https://doi.org/10.1080/09588221.2015.1111910>
- [22] Kang, N. (2015). The comparison between regular and flipped classrooms for EFL Korean adult learners. *Multimedia-Assisted Language Learning*, 18(3), 41-72. DOI: <https://doi.org/10.1515/mall-2015-0003>
- [23] Låg, T., & Sæle, R. G. (2019). Does the flipped classroom improve student learning and satisfaction? A systematic review and meta-analysis. *AERA open*, 5(3), 2332858419870489. DOI: <https://doi.org/10.1177/2332858419870489>
- [24] Liyanae, I., Bartlett, B., Birch, G., & Tao, T. (2012). To be or not to be? Metacognitive: Learning EFL strategically. *Electronic Journal of Foreign Language Teaching*, 9(1), 5–25.

- [25] Murillo-Zamorano, L. R., Sánchez, J. Á. L., & Godoy-Caballero, A. L. (2019). How the flipped classroom affects knowledge, skills, and engagement in higher education: Effects on students' satisfaction. *Computers & Education*, *141*, 103608. <https://doi.org/10.1016/j.compedu.2019.103608>
- [26] McLean, S., & Attardi, S. M. (2018). Sage or guide? Student perceptions of the role of the instructor in a flipped classroom. *Active learning in higher education*, 1469787418793725. DOI: <https://doi.org/10.1177/1469787418793725>
- [27] Lo, C.K., Hew, K.F. (2017). A critical review of flipped classroom challenges in K-12 education: possible solutions and recommendations for future research. *RPTTEL*, *12*, 1-22. <https://doi.org/10.1186/s41039-016-0044-2>
- [28] Nja, C. O., Orim, R. E., Neji, H. A., Ukwetang, J. O., Uwe, U. E., & Ideba, M. A. (2022). Students' attitude and academic achievement in a flipped classroom. *Heliyon*, *8*(1), e08792. <https://doi.org/10.1016/j.heliyon.2022.e08792>
- [29] Sailer, M., & Sailer, M. (2021). Gamification of in-class activities in flipped classroom lectures. *British Journal of Educational Technology*, *52*(1), 75-90. <https://doi.org/10.1111/bjet.12949>
- [30] Shana, Z., Alyatim, T. M., Alkhazaleh, M., & Alshalabi, N. (2021). The use of Google Classroom to support the learning process. *International Journal of Web-Based Learning and Teaching Technologies*, *16*(5), 171-192. <https://doi.org/10.4018/IJWLTT.20210901.oa10>
- [31] Simonson, SR. (2017). To flip or not to flip: What are the questions? *Education Sciences*, *7*(3), 71-81. <https://doi.org/10.3390/educsci7030071>
- [32] Shaharane, I. N. M., Jamil, J. M., & Rodzi, S. S. M. (2016). The application of Google Classroom as a tool for teaching and learning. *Journal of Telecommunication, Electronic and Computer Engineering (JTEC)*, *8*(10), 5-8. <https://doi.org/10.7763/jtec.2016.v8.737>
- [33] Strayer, J. F. (2012). How learning in an inverted classroom influences cooperation, innovation and task orientation. *Learning Environments Research*, *15*, 171-193. <https://doi.org/10.1007/s10984-012-9108-4>
- [34] Teo, T., Sang, G., Mei, B., & Hoi, C. K. W. (2019). Investigating pre-service teachers' acceptance of Web 2.0 technologies in their future teaching: a Chinese perspective. *Interactive Learning Environments*, *27*(4), 530-546. <https://doi.org/10.1080/10494820.2018.1489290>
- [35] Ushioda, E. (2013). 1. Foreign Language Motivation Research in Japan: An 'Insider' Perspective from Outside Japan. In M. Apple, D. Da Silva & T. Fellner (Ed.), *Language Learning Motivation in Japan* (pp. 1-14). Bristol, Blue Ridge Summit: Multilingual Matters. <https://doi.org/10.21832/9781783090518-003>
- [36] Weng, F., Yang, R. J., Ho, H. J., & Su, H. M. (2018). A TAM-based study of the attitude towards use intention of multimedia among school teachers. *Applied system innovation*, *1*(3), 36. <https://doi.org/10.3390/asi1030036>
- [37] Xu, L. J., Yu, S. Q., Chen, S. D., & Ji, S. P. (2021). Effects of the flipped classroom model on student performance and interaction with a peer-coach strategy. *Educational Studies*, *47*(3), 292-311. <https://doi.org/10.1080/00131946.2021.1891327>
- [38] Yilmaz, F. G. K., & Yilmaz, R. (2023). Exploring the role of sociability, sense of community and course satisfaction on students' engagement in flipped classroom supported by Facebook groups. *Journal of computers in education*, *10*(1), 135-162.
- [39] Yang, C. C. R. (2017). An investigation of the use of the 'flipped classroom' pedagogy in secondary English language classrooms. *Journal of Information Technology Education: Innovations in Practice*, *16*(1). <https://doi.org/10.1007/s10639-021-10511-5>
- [40] Zhu, Z., Xu, Z., & Liu, J. (2023). Flipped classroom supported by music combined with deep learning applied in physical education. *Applied Soft Computing*, *137*, 1-9. <https://doi.org/10.1016/j.asoc.2023.110039>

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