

The Development of a Full Online Flipped Classroom Instructional Model for Enhancement of Engineering Students' English Meeting Skills and Learning Engagement

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Article information

Abstract

The flipped classroom instructional approach gained popularity after the COVID-19 pandemic, which significantly disrupted language instruction. This study aimed to evaluate the effectiveness of a full online flipped classroom instructional model to enhance students' meeting skills and their engagement. The model consisted of two lessons: group meeting skills and writing the minutes of meetings. The participants comprised 48 third-year undergraduate engineering students from a public university in Thailand. The study utilized the KW#4 principle to compare average scores of passing students in formative and summative assessments, and to analyze pre-test and post-test scores, aiming to evaluate the model's impact on students' meeting skills. Student engagement (affective, behavioral, and cognitive) was examined using a questionnaire and semi-structured interviews. The results showed that the model was effective, as the post-test scores were significantly higher than the pre-test scores. Further, the results from the KW#4 revealed that the model was effective since the effectiveness of criterion learning (formative and summative tests' average percentage) in using

	the flipped classroom to enhance group meetings and the minutes of the meetings of the students was 87.6/82.8 and 74.06/74.02, which was higher than that of the set standard criteria of 60/60. The students also demonstrated a high level of positive cognitive, behavioral, and affective engagement. The study provides a holistic perspective on the effectiveness and practicality of the model, thus yielding further support for technology-integrated language instruction in ESP courses.
Keywords	Engineering students, English for Specific Purposes, English meeting skills, full online flipped classrooms, student engagement
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1. Introduction

In times of disruptions such as the recent COVID-19 global pandemic, during which government measures forced classes to move online (Chongkolrattanaporn & Kongpolphrom, 2023), technology could play a crucial role in helping teachers adapt to the emerging necessity to change their modes of instruction without prior preparation. The online flipped classroom has become an instructional model that can address the changing needs of teachers who encounter unexpected disruptions and have to find alternative teaching methods that enable them to carry out their duties and responsibilities.

The term “flipped classroom” traditionally refers to a teaching approach where direct teaching during class time and homework are reversed (Bergman & Sams, 2012). When a flipped classroom is implemented in language instruction, students learn the content of the course by watching videos at home at their own pace before coming to class. What they do in class is to practice their language

skills based on the lessons from the videos. The online flipped classroom became an alternative teaching approach during the time of the COVID-19 pandemic, as teachers were forced to teach using online technology. Some scholars have called this teaching approach the “full online flipped classroom” (Jia et al., 2023).

The full online flipped classroom, in comparison to traditional online instruction, offers improved accessibility and flexibility through online platforms, eliminating the logistical challenges associated with physical resources (Bergman & Sams, 2012; Hung, 2015; Suludere, 2017). In other words, it makes use of technological advancements by increasing access to educational materials and offering a flexible learning environment to students. Therefore, what distinguishes the traditional flipped classroom from the full online flipped classroom is that students do not need to practice their language skills in physical classes after watching the videos at home—practice occurs synchronously via online platforms instead (Hung, 2022). Full online flipped classrooms are beneficial because it is believed that when technology is integrated into language teaching, engagement, and personalization can be promoted. Other benefits of full online flipped classrooms include the availability of multimedia resources, accessibility to interactive exercises, the promotion of self-learning behavior, opportunity for time-saving in class, and the provision of a chance for students to engage in authentic communication (Alsowat, 2016; Strayer, 2012).

In addition to the aforementioned benefits, a number of previous studies have pointed out that the full online flipped classroom helps students improve their language skills. For example, Pratiwi et al. (2022) and Reflianto et al. (2021) employed the full online flipped classroom in order to effectively develop their tertiary students’ reading and speaking skills. In addition, Roohani and Rad (2022) improved their tertiary students’ essay writing skills by using the flipped classroom method, while Anggoro and Khasanah (2022) enhanced their first-year students’

vocabulary, grammar, and reading skills using the full online flipped classroom. Additionally, Thatphaiboon and Sappapan (2022) utilized the full online flipped classroom to teach their students listening skills. The results of these studies confirm the benefits of using the full online flipped classroom in teaching English reading, writing, speaking, listening, vocabulary, and grammar. However, to the best of our knowledge, only a few studies have examined the effectiveness of this teaching approach in teaching meeting skills (group meetings and writing the minutes of meetings), especially for engineering students.

In addition to the benefits it offers regarding language skill development, the full online flipped classroom can also enhance student engagement, which refers to the active participation of students that try to make sustained efforts to comprehend content, ensuring positive learning outcomes (Xue, 2023). This is because the full online flipped classroom promotes active participation when students are engaged in online learning activities (Holik, 2019; Long, 2017; Swensen, 2022). However, even though previous research has highlighted the engagement potential of online flipped classrooms in language teaching (Lee & Wallace, 2018; Reflianto et al., 2021), there are very few studies that have emphasized the engagement potential of the full online flipped classroom for students that are in the process of developing meeting skills. Therefore, the objectives of the present study were as follows:

1. To investigate the effects of a full online flipped classroom instructional model on the development of the English meeting skills of engineering students.
2. To examine the effects of a full online flipped classroom instructional model on the engagement of undergraduate engineering students.

2. Literature Review

2.1 Flipped Classrooms

This pedagogical approach of flipped classrooms introduced by chemistry teachers Bergmann and Sam in 2012 involves shifting content delivery outside the classroom and encouraging active learning during class (Bergmann & Sam, 2012; Bishop & Verleger, 2013). A flipped classroom model assigns online videos or readings as homework, enabling individualized learning at students' own pace so that class time can be dedicated to collaborative activities, reinforcing prior knowledge through practical application. In other words, a flipped classroom supports self-paced learning outside class through prepared materials and assignments (learner-centered), while class time fosters an active learning environment through collaboration.

Some scholars refer to the learning process in a flipped classroom as flipped learning (Flipped Learning Network, 2014; Kostka & Lockwood, 2015; Pisut, 2020). Flipped learning, arising from “flipping a class,” involves conducting lectures outside the classroom, with in-class time dedicated to interactive activities (Bishop & Verleger, 2013; Strayer, 2012). Four pillars guide flipped learning design: a flexible environment, a learning culture, intentional content, and a professional educator (Flipped Learning Network, 2014). Talbert (2017)'s three-phase framework of a flipped classroom offers a structured approach to teaching using flipped learning. The framework consists of the out-of-class or pre-class phase, in-class phase, and post-class phase. In the pre-class phase, work involves students learning at their own pace using online resources to learn the expected key knowledge, with quizzes or worksheets to check understanding. Post-class work engages students in higher-order thinking tasks, applying knowledge learned in class. The in-class phase emphasizes interactive activities promoting active learning, such as group discussions and problem-solving tasks.

The benefits of a flipped classroom include promoting self-learning behaviors, self-paced learning, and time savings in class (Al-Mulhim, 2021; Hsieh et al., 2017; Tucker et al., 2017). Students benefit from collaborative activities, gaining critical thinking, and problem-solving skills when they have the opportunity to work with others. It is also advantageous to teachers who have more chances to understand students' progress so that they can provide appropriate support to them. However, there are also drawbacks of a flipped classroom including students' potential non-engagement, increased teacher workload, students' less attention on self-study, disconnection between pre-class and in-class activities, and challenges related to Internet accessibility and technological knowledge (Bergmann & Sams, 2012; Egbert et al., 2015; Enfield, 2013; McLean, 2017).

2.2 Full Online Flipped Classrooms

The term “full online flip classroom” gained popularity in 21st Century education, particularly during the COVID-19 pandemic, aligning with the traditional flipped classroom but distinct in that it eliminates the need for in-person interactions (Jia et al., 2023; Rohmah & Aditya, 2023). When a full online flipped classroom is implemented, students asynchronously engage with pre-class content through recorded videos and e-books, followed by in-class synchronous activities facilitated via digital platforms such as Zoom, Google Meet, and Microsoft Teams (Hung, 2015). Pratiwi et al. (2022) and Reflianto et al. (2021) emphasize the benefits of a full online flipped classroom, noting improvements in reading skills, engagement, and speaking performance after it was implemented with their students. In addition, Anggoro and Khasanah (2022), Diningrat et al. (2022), Roohani and Rad (2022) point out that the positive impacts of full online flipped classrooms include promotion of self-directed learning, writing skills, and multi-skill language development. In one study, Thatphaiboon and Sappapan (2022) found a group of undergraduate students improved their listening skills after a full online flipped classroom was introduced.

2.3 Learning Engagement

Learning engagement is a multidimensional concept, challenging to precisely define (Li & Li, 2022; Li & Wang, 2023). It encompasses the frequency of student participation in both in-class and out-of-class activities (Reflianto et al., 2021). Bond (2020) characterizes learning engagement as the energy and effort learners invest, observable through behavioral, cognitive, and affective markers. Learning engagement is influenced by interactions in class, learning activities, and the learning environment, reflecting students' quality of investment and indicating effective learning (Philp & Duchesne, 2016). In general, learning engagement can be observable through students' effort in completing language learning tasks, which can be measured behaviorally, affectively, and cognitively using instruments. Learning engagement can be divided into different aspects as follows (Fredricks et al., 2004):

2.3.1 Affective Engagement

Affective engagement encompasses students' emotions (positive and negative) towards the teacher, classmates, and various lesson elements, including content, teaching methods, technology, preparation, and classroom activities. This engagement reflects students' enjoyment in the instructional model, observed through interactions during all phases of a full online flipped classroom, contributing to increased class rapport (Jia et al., 2023; Meeuwisse et al., 2010).

2.3.2 Behavioral Engagement

Behavioral engagement refers to students' positive behaviors expressed in class such as participation in language learning tasks and compliance with their teacher's rules (Alicea et al., 2016). It reflects students' willingness to handle tasks and can be observed when students show their attentiveness to practice activities, while they are in all instructional phases. It is demonstrated through the responsible submission of homework and assignments.

2.3.3. Cognitive Engagement

Cognitive engagement refers to how students invest themselves in the process of learning (Trowler, 2011). It involves students' mental efforts, interest in learning, and problem-solving during tasks. This includes self-reflection on learning strategies, success, and failure.

Numerous studies highlight the positive impact of a flipped classroom on student engagement. Li and Li (2022) identify key factors influencing learner engagement in the EFL classroom, emphasizing its dynamic and context-dependent nature. In the context of a full online flipped classroom, Jia et al. (2023) found positive engagement across behavioral, cognitive, and affective engagement. Similarly, Reflianto et al. (2021) observed positive engagement in reading lessons via online flipped classrooms, and Lin et al. (2019) explored student engagement in various online activities, revealing high engagement in both synchronous and asynchronous settings.

2.4 Designing a Teaching Model

Instructional models are systematic processes guiding the development of effective teaching materials aligned with lesson objectives. They play a pivotal role in modern education (Evans, 2023; Kurt, 2021). Models aid in conceptualizing complex teaching strategies (Lakshminarayana, 2022). The model adopted in this study comprised input, process, and output components (Salam, 2015). The input included the objectives and content that the teacher anticipated students to accomplish. The process encompassed the expected teaching method or the process for delivery of the input, while the output was the outcome of the input and process that needed to be evaluated. Drawing upon the analysis and synthesis of the literature discussed above, the conceptual framework of this study was formulated as follows:

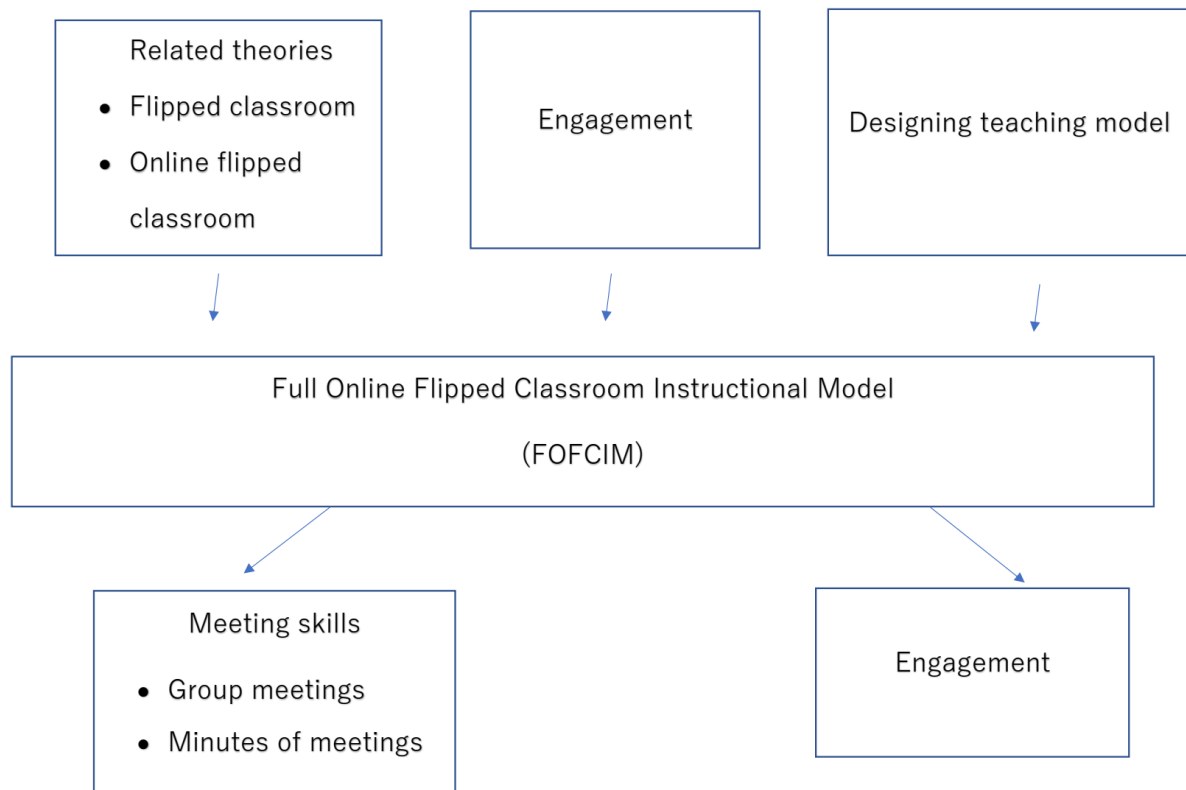
Figure 1*Conceptual Framework of the Study*

Figure 1 shows the study framework, describing the teaching of meeting skills using the full online flipped classroom instructional model. The model was developed based on the flipped classroom concept, engagement, and designing a teaching model. With this model, the students were asked to study the expected lessons (group meetings and writing the minutes of meetings) according to the three teaching stages of a full online flipped classroom.

3. Methodology

3.1 Research Design

This quasi-experimental study employed a one-group pretest-posttest design. It used a mixed-method approach to collect qualitative and quantitative data since this approach facilitated data triangulation, resulting in more reliable data.

3.2 Participants

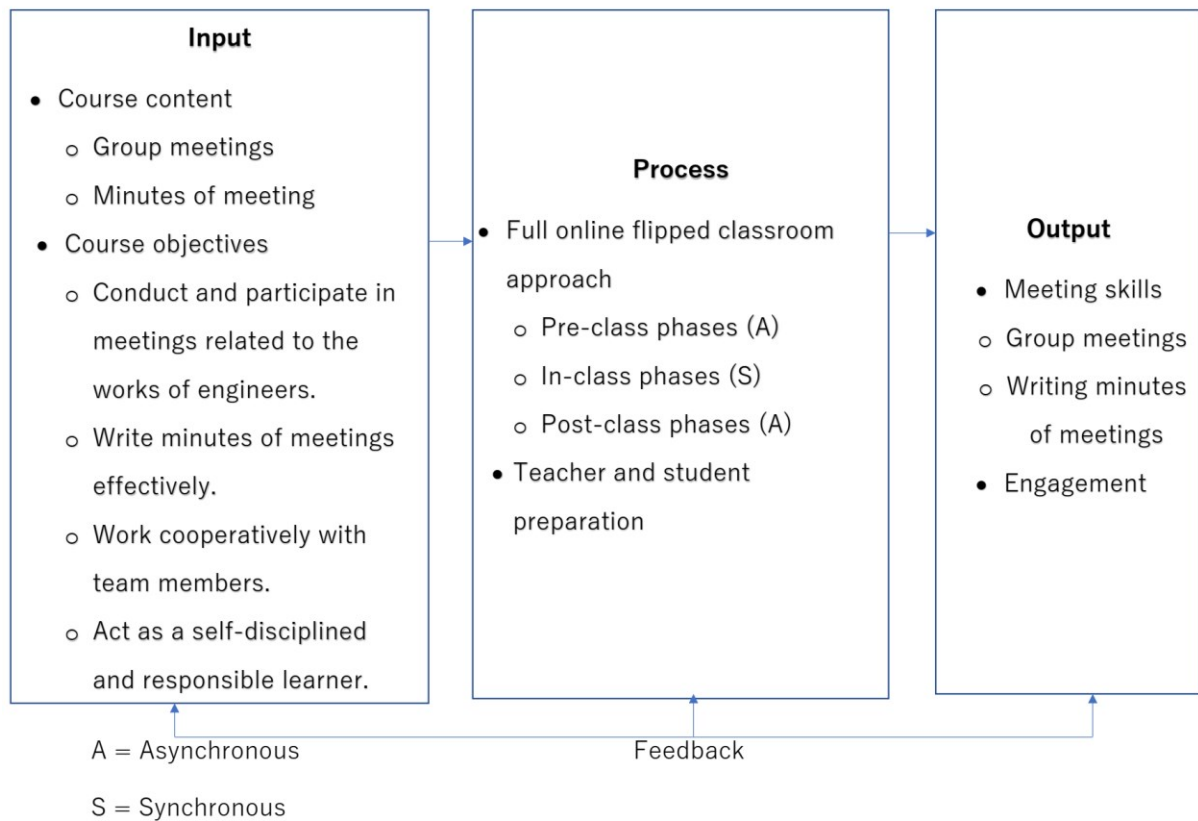
The study participants consisted of 48 third-year chemical engineering students studying at King Mongkut's University of Technology North Bangkok (KMUTNB) during the second semester of the academic year 2021. There were 35 females and 13 males, and they were taking an online elective course entitled "English for Engineers" after having completed three prerequisite English courses. These students underwent an in-house English proficiency test at the beginning of the course, and the results indicated no significant difference in intermediate English levels.

3.3 Research Instruments

The instrument employed in this study encompassed the full online flipped classroom Instructional model, lessons, pre-test and post-test, formative and summative tests, engagement questionnaire, and engagement interview questions. Three experts in English language teaching validated all the research instruments. The item-objective congruence index (IOC) score for all instruments was above .8, indicating that they were valid.

3.3.1 Instructional Model

The full online flipped classroom instructional model was developed based on an extensive literature review. The model is presented in Figure 2.

Figure 2*Full Online Flipped Classroom Instructional Model*

As illustrated in Figure 2, the instructional model included four elements: input, process, output, and feedback. The input element addressed the details of the contents and their objectives. The process element identified the teaching approach, the full online flipped classroom, to deliver the input to the students and the teacher and student preparation. The preparation was crucial because both the teacher and students were required to master specific skills. The details of the teaching approach and preparation will be described later. The output of this study was mastering meeting skills: group meetings, writing the minutes of meetings, and the students engaging with the lessons and teaching approach. Feedback was vital as it helped reflect the effectiveness of the teaching approach and materials towards the students' achievement.

Regarding the preparation phase, the teacher had to master the use of technology in teaching, such as teaching platforms, LINE, and videos. Therefore, teacher training on using technology was required. For this study, Zoom was chosen as the teaching platform with videos, while Google Classroom was utilized to post videos and tests, and for students to submit tests and assignments. Zoom was selected due to its user-friendly interface and the essential functions it offered, which facilitated online teaching to resemble traditional classroom instruction. Also, the students could access it easily. LINE was utilized for teacher-student communication throughout the course. In addition, the teacher needed to encourage the students to be aware of the importance of self-study and train them to know how to plan for self-study. This was because previous research pointed out that one of the reasons why flipped classroom lessons failed was because students were not familiar with self-study (Erlinda, 2018). Other training sessions included collaborative learning, studying using the full online flipped classroom, and learning using Zoom and Google Classroom.

As for the full online flipped classroom approach, the teaching procedure and technology adoption were separated into three phases: 1. pre-class, 2. in-class, and 3. post-class. In the pre-class phase, students studied asynchronously at home, with an emphasis on self-study activities like watching videos, completing listening journals, and writing meeting minutes. In the in-class phase, Zoom facilitated activities that promoted active learning, focusing on group work such as discussions. No lectures were given; students practiced synchronously with peers and the teacher, applying pre-class learning. Formative and summative tests were used to assess students' achievements. Post-class activities involved assignments for autonomous learning, focusing on higher-order thinking activities such as group meeting videos.

3.3.2 Meeting Lessons

The lessons covered two topics: group meetings and the minutes of meetings, designed using insights from needs analysis results that were conducted by the researcher of this study, discourse analysis, and move analysis, along with input from prior studies (Changpueng & Patpong, 2021; Changpueng & Wattanasin, 2018; Handford, 2010). The group meeting completely addressed problem-solving sessions. Six 20-minute videos were created, incorporating higher-order thinking activities for meaningful in-class participation. The group meeting content encompassed meeting-related vocabulary and expressions, etiquette, and communication strategies for meeting leaders and participants, along with materials on writing meeting minutes, including vocabulary, listening materials, move analysis results, and grammar points.

3.3.3 Formative and Summative Tests

To investigate the effectiveness of the full online flipped classroom teaching model, the KW#4 principle (Wattananarong, 2014) was applied for performance evaluations. It refers to a method that can be used to assess effectiveness of any newly developed model by comparing the average scores of the students who pass formative and summative tests.

According to the KW#4 principle, the formative test evaluates how well students grasp the lessons, allowing teachers to observe their learning process, provide ongoing feedback, and aid students in identifying their strengths and weaknesses. On the other hand, summative tests can be used to assess students' achievement at the end of the lessons.

In the present study, as for the formative test, students worked in a group of five to perform and record role-plays based on self-created meeting situations and agendas. They presented a video lasting five to seven

minutes. The summative test involved an impromptu role-play which required students to conduct group meetings based on provided engineer-related problem-solving scenarios and agendas. The difficulty index of the formative and summative tests was 0.47 and 0.66, respectively, and the inter-rater reliability score was 0.94, indicating a high reliability level.

As regards meeting minute writing, the formative test required the students to listen to a meeting of two engineers and take notes. Two test items, which lasted about 40 minutes, included completing sentences and writing notes based on the conversations. In the summative test, students listened to engineers' meetings and composed meeting minutes within one hour and 20 minutes. The difficulty index of the test was 0.65 and the inter-rater reliability was 0.95.

3.3.4 Pre-Test and Post-Test

The pre-test and post-test were also used with an aim to gauge students' progress. It is worth noting that there were both the pre-test and the post-test of meeting minute writing, but there was only the post-test of group meeting due to time constraint.

3.3.5 Engagement Questionnaire and Interview Protocol

The study evaluated student engagement in a full online flipped classroom using a 26-item questionnaire and a semi-structured interview protocol created by the researchers. The five-point rating scale questionnaire contained items eliciting quantitative data regarding the students' affective engagement (10 items), behavioral engagement (6 items), and cognitive engagement (10 items). There was also an open-ended section for the students to describe their impressions and the challenges they faced. When it was tried out with 40 engineering students,

it was found that the reliability of the questionnaire was 0.96. The questions were also tested with three volunteers to check their clarity.

3.4 Data Collection and Data Analysis

Before implementation of the full online flipped classroom, the meeting minute writing pre-test was administered. After that, six videos on meeting skills and meeting minute writing were shown following the three phases of the full online flipped classroom approach. The videos were posted *via* Google Classroom every Monday before the class time on Friday. Student practices and teacher feedback sessions were conducted via Zoom.

The group meeting formative test was conducted after the third video was posted and practiced. Then, feedback was given for students to improve their group meeting skills. The group meeting post-test was administered in the last week of the semester via Zoom. The minutes of meetings formative test was arranged after the fifth video was posted and practiced, and the summative test was conducted after the sixth video was posted and practiced via Google Classroom. After all the tests were administered, the students were asked to respond to the engagement questionnaire, and ten students were randomly interviewed.

The pre-test and post-test scores were compared to see the progress of the students using the dependent *t*-test. And Cohen' *d* was calculated to determine the effect size. For both formative and summative tests, the standard criterion was set at 60/60 to validate learning processes and outcomes according to the KW#4 principle. The passing score was set at 60 as it was appropriate for performance tests (Wattanarong, 2014). The quantitative data collected from the questionnaire were analyzed using mean and standard deviation, and the qualitative data from the open-ended questions and the interviews were analyzed using thematic analysis (Willig, 2013).

4. Results

4.1 Effectiveness of the full online flipped classroom instructional model in enhancing English meeting skills of engineering students

The results of the model evaluation showed that the full online flipped classroom was effective to develop students' skills in writing meeting minutes (74.06/74.02) and to conducting group meetings (87.6/82.8) as the obtained values were higher than the standard criterion of 60/60, as shown in Tables 1 and 2 below.

Table 1

The Results of the Formative and Summative Test on Group Meeting Skills

Tests	Criteria %	Group Meetings		
		Full score	Average	Percentage of average
Formative	60	10	8.7	87.6
Summative	60	44	36.4	82.8

Table 2

The Results of the Formative and Summative Tests on Writing Meeting Minutes.

Tests	Criteria %	Minutes of Meetings			
		Full score		Average	
		Item 1	Item 2	Item 1	Item 2
Formative	60	5	4	3.5	3.1
Summative	60	16		11.8	
					74.02

In addition, as regards meeting minute writing, the results revealed that the post-test mean score ($M = 11.84$, $SD = 1.58$) was higher than the pre-test mean score ($M = 4.17$, $SD = 1.80$). It was also found that the difference in the pre-test and post-test mean scores was statistically significant ($p < .01$). The effect size was 11.84, which was considered a large effect size (Thalheimer & Cook, 2002), as shown in Table 3.

Table 3

Comparison Between the Pre-Test and Post-Test Mean Scores of Meeting Minute Writing

Tests	N	M	SD	<i>t</i>	df	Cohen's <i>d</i>
Pre	48	4.17	1.80	26.9	47	11.84
Post	48	11.84	1.58			

***p* < .01

The qualitative findings yielded support to the quantitative results. The students agreed that their meeting skills were improved due to a chance to prepare themselves before each session, as one of them explained, “I could learn the lessons from the videos before class, so I could prepare myself before practicing in class. Thus, when I practiced in class with friends and the teacher, I could do it well.” Moreover, some students found that the time allocated for practice was helpful, as one pointed out, “There was no lecture during class times, so we had a lot of time to practice and receive feedback from the teacher.”

4.2 Student Engagement

According to the study findings, the students demonstrated a high level of affective engagement. They strongly agreed with aspects such as watching instructional videos before class (*M* = 4.23, *SD* = 0.78), flexible self-paced learning (*M* = 4.52, *SD* = 0.68), and independent listening practice of the minutes of meetings as preparation for meeting minute writing (*M* = 4.21, *SD* = 0.74). The use of digital media and the use of authentic materials also received a high level of agreement (*M* = 4.71, *SD* = 0.50 and *M* = 4.44, *SD* = 0.68, respectively). Also, students appreciated the opportunity to practice group meetings using authentic engineering situations (*M* = 4.63, *SD* = 0.67) and they thought that the meeting lessons would be useful for their work in the future (*M* = 4.56, *SD* = 0.58).

Table 4*The Students' Affective Engagement*

Statements	M	SD	Levels
1. I think studying the English for Engineers course through the flipped classroom method is good.	4.27	0.61	strongly agree
2. I enjoy studying the English for Engineers course through the flipped classroom method because of the following:			
• Watching the videos before class enables me to understand the lessons clearly	4.23	0.78	strongly agree
• I can watch the video at my own pace before attending class	4.52	0.68	strongly agree
• Watching the videos before class enables me to have a lot of time to practice skills in class	4.15	0.82	agree
• Watching the videos before class enables the teacher to have more time to give the students feedback both in groups and as individuals.	4.40	0.74	strongly agree
3. Employing digital media such as Google Classroom, Zoom, LINE, and Google Forms in teaching is convenient for studying, accessing materials, and submitting assignments.	4.71	0.50	strongly agree
4. I like the independent listening practice of the minutes of meetings as a preparation for writing minutes.=.	4.21	0.74	strongly agree
5. I like the examples in the lessons and writing prompts of the minutes of meetings and invitation e-mail as they are authentic materials.	4.44	0.68	strongly agree
6. What I like is that I can practice group meetings using the authentic engineering situations.	4.63	0.67	strongly agree

Statements	M	SD	Levels
7. I like the teaching materials in the course.	4.44	0.68	strongly agree
8. I like all of the meeting lessons as they are useful for my work in the future.	4.56	0.58	strongly agree
9. What I like is the coaching of the teacher.	4.71	0.50	strongly agree
10. What I like is that the teacher spends a lot of time in giving feedback after all of the activities in class, testing, and doing homework.	4.67	0.60	strongly agree
Total	4.46	0.42	strongly agree

Interview findings also revealed positive affective engagement among students. They appreciated its effectiveness, as well as the fact that the full online flipped classroom saved time, increased in-class practice, and enabled them to prepare before class. Their affective engagement was evident in their statements such as “I liked watching the videos before attending the class since I knew the lessons in advance. Thus, I could prepare myself,” “I liked the videos because I could watch them at my own pace,” and “Flipped teaching was great because we had ample time to practice in class with friends and we didn’t need to waste time learning content during class.”

However, mixed feelings could be observed. For instance, some of the students did not like watching videos before class because they already felt overwhelmed with assignments from other courses. One student stated “There were so many videos to watch. It was very exhaustive for me since I was taking many courses and all of them required me to watch many long videos,” and another shared “There were many homework assignments to complete this semester, so I didn’t have much time to watch so many videos.”

The data collected from the open-ended questionnaire revealed that students enjoyed the full online flipped classroom, finding the orientation useful and the preparatory section valuable. One student said, “The course orientation was good since the teacher described things in detail. I could see the picture of our course that the focus was self-study training as we had to learn things by ourselves.” Another commented, “I understood more about learning using the Zoom platform and how the teacher would use it in our online class.” However, even though the students liked studying with videos before class for relevance, they wanted more note-taking and listening practice.

In short, students favored the flexible pre-class study and effective group practice but had specific suggestions for course improvement. Most students were comfortable with online learning, with a few expressing concerns about excessive video watching.

With regards to students’ behavioral engagement in the full online flipped classroom, the findings showed that they watched videos before class ($M = 4.25$, $SD = 0.86$) and practiced listening to prepare themselves for writing meeting minutes ($M = 3.80$, $SD = 0.89$). They also demonstrated high responsibility in completing their homework and assignments ($M = 4.27$, $SD = 0.84$) and they actively participated in the in-class activities ($M = 4.50$, $SD = 0.65$), as can be seen in Table 5.

Table 5*The Students' Behavioral Engagement*

Statements	M	SD	Levels
1. I always learn the lessons from watching the video before attending the class.	4.25	0.86	strongly agree
2. I frequently practice listening in order to get ready for writing the minutes of meetings.	3.80	0.89	agree
3. I pay attention to studying energetically using the flipped classroom method.	4.02	0.86	agree
4. I pay attention to all of the in-class activities.	4.50	0.65	strongly agree
5. I energetically pay attention to working in groups.	4.54	0.65	strongly agree
6. I always do homework and assignments after class.	4.27	0.84	strongly agree
Total	4.24	0.59	strongly agree

The findings from the interviews were also in congruence with the results of the questionnaire. Students showed proactive behavioral engagement with the flipped classroom approach. For example, one student said, “I always watched the videos before class,” and another stated, “I was willing to pay attention to all of the in-class activities.” Collaboration was evident as one student described, “My group always searched for information from the Internet or asked someone in order to finish our assignments.” Another student emphasized the valuable role of peer learning and mutual support in task completion, explaining “I learned many things from friends. We helped each other finish the assigned tasks.” Overall, these findings highlighted positive learning behaviors as autonomous learners and cooperative attitudes among students after the implementation of the full online flipped classroom.

However, it is noteworthy that there were students who found out-of-class video watching demanding, considering it unfair for the teacher to extend study time. They recommended shorter videos and limiting class and overall learning time, stating “Videos should be under 20 minutes, class time should be two hours 40 minutes, and overall learning time, in and out of class, should be within three hours.” In addition, a number of students expressed discomfort with online group work, citing communication challenges and a lack of ideas within their groups, saying “Doing group work online was difficult; my friends in the group were always silent. I did not know what they thought” and “Normally, my group was lazy; we did not have ideas to finish the tasks. It always took quite a long time to finish tasks.”

To sum up, most students had behavioral engagement with the full online flipped classrooms, even though they may have experienced some difficulties such as a lack of time to watch videos or a lack of cooperation from their group members.

Finally, when it came to cognitive engagement, most of the students agreed that the full online flipped classroom teaching method improved their knowledge and meeting skills. They learned effective planning with friends ($M = 4.31$, $SD = 0.72$). Furthermore, they felt confident in conducting group meetings and writing minutes of a meeting ($M = 3.98$, $SD = 0.81$ and $M = 3.83$, $SD = 0.97$, respectively). It was also found that the students often rehearsed meetings before presenting to the class ($M = 4.23$, $SD = 0.90$), as shown in Table 6.

Table 6*The Students' Cognitive Engagement*

Statements	M	S.D.	Levels
1. I can provide examples of the vocabulary and expressions that engineers should know in order to attend group meetings effectively.	4.10	0.59	agree
2. I can provide examples of the vocabulary and expressions that engineers should know in order to write the minutes of meetings effectively.	3.94	0.73	agree
3. I can apply what I have learned regarding moves and steps in order to write the minutes of meetings.	4.40	0.71	strongly agree
4. I can see the connections of the lessons from each week.	4.19	0.76	agree
5. I can apply what I have learned from the video to in-group meetings and meeting minute writing.	4.19	0.87	agree
6. I can attend group meetings and use the language appropriately based on the meeting contexts.	3.98	0.81	agree
7. I can write the minutes appropriately based on the meeting contexts.	3.83	0.69	agree
8. My group members plan to practice group meetings and writing minutes whenever we are required to do by the teacher.	4.31	0.72	strongly agree
9. My group always practices the group meeting tasks more than once before presenting them to the class.	4.23	0.90	strongly agree
10. My group members always review both errors and good points from our practice in order to improve our skills for the next meeting practice.	4.17	0.75	agree
Total	4.13	0.46	agree

The findings from the interviews also supported the quantitative findings that students had cognitive engagement after the implementation of the full online flipped classroom. The students agreed that they learned meeting skills from the lessons and activities, mentioning their progress in meeting expressions and minute writing using specific moves and steps, stating “I knew nothing at first, but now I’ve learned meeting expressions and writing minutes using moves and steps.” Furthermore, one student highlighted the effectiveness of sequencing teaching materials with feedback explaining, “Sequencing the teaching materials from easy to difficult, with feedback after each activity, helped our group learn from mistakes and improve our expressions and vocabulary in the next practice,” while another student emphasized the crucial role of planning for online work in optimizing the learning experience, pointing out “Planning online group and individual work was crucial. It helped us avoid wasting time on assignments and made our online learning experience more effective.”

The open-ended responses confirmed student comfort with lessons and their acquisition of valuable information on engineering meetings.

In summary, students enhanced their meeting skills, vocabulary, and speaking confidence. Students shared valuable insights about their learning preferences after the implementation of the full online flipped classrooms even though there may have been some elements that they did not like or prefer.

5. Discussion

5.1 The effects of the full online flipped classroom instructional model on meeting skills and meeting minute writing skills

The full online flipped classroom instruction model was effective to improve students’ meeting skills for several reasons. First, it offered a flexible learning environment in the pre-class phase, promoting self-study. The students could study at their own pace, so they could manage their time to study and review the

lessons before class time. In doing so, the students had time to prepare themselves for studying during the in-class phase. This also promoted autonomous learning. Erlinda (2018) points out that one of the key principles of the flipped classroom is that it supports learner-centered teaching. Since time was saved for practicing during the in-class phase, the students had time to practice with their friends and the teachers using collaborative learning activities that encouraged active learning and problem-solving skills. According to Gibbons (2002), students can learn from their interaction with their teachers and friends in class. Collaborative work in and outside the classroom is another key point of teaching using the flipped classroom (Flores & Silva, 2016). This can be seen clearly from the scores of the students after watching the videos, and they also performed well in the in-class phase. As the students had more time to practice during the in-class phase, the teacher could pay attention to them individually and give them immediate feedback after the activities had been completed. This was vital as each student had different levels of language proficiency, so they required different amounts of assistance from the teacher. Cockrum (2014) contends that a flipped classroom is appropriate for the heterogeneous language ability classroom as teachers have time to assist each student individually. As for the post-class phase, the students had to do follow-up assignments and homework using what they learned from the previous phases. In so doing, they needed to review the lessons in order to comprehend the key knowledge and practice. Moreover, the use of media and digital technology in teaching was able to develop the students' language skills since they could make use of these tools to perform what they learned in the online classroom effectively (Erlinda, 2018). For all of these reasons, the students could foster their performance and this promoted their motivation to study, hence more opportunity for skill development. A number of researchers have reported similar results. For example, Pratiwi et al. (2022) taught their students speaking skills of job interviews using the full online flipped classroom approach, while Thatphaiboon and Sappapan (2022) employed the same teaching method to teach their students listening skills. Similarly, both

studies confirmed the effectiveness of the full online flipped classroom teaching procedures.

5.2 The effects of the full online flipped classroom instructional model on student engagement

The positive student engagement with the full online flipped classroom was consistent with prior research on full online or online flipped classroom approaches (Jia et al., 2023; Li & Wang, 2023; Reflianto et al., 2021). Examining affective, behavioral, and cognitive engagement, this study identified the factors contributing to both positive and negative engagement of engineering students.

First, familiarity with the teaching method was found to be crucial. In this study, the students were familiarized with the teaching method as the teacher provided the course orientation via Zoom. This pre-class phase focused on the full online flipped classroom teaching method, emphasized the importance of the lessons, and featured a time management workshop. Familiarity with the instructional model resulted in clarity, which in turn resulted in positive feedback from the students who showed affective engagement. Many scholars have pointed out that familiarizing students with a new teaching method is vital (Hew et al., 2020; Jia et al., 2023; Lo & Hew, 2017). However, some studies have pointed out that traditional or full online flipped classroom models may overlook the significance of familiarity (Anggoro & Khasanah, 2022; Roohani & Rad, 2022; Thatphaiboon & Sappapan, 2022). This was probably due to a misunderstanding that students can easily adopt new technology because they are digital natives. However, flipped classrooms require not only technology skills but also self-study skills and collaborative learning skills. Therefore, it is essential to familiarize students with these skills to ensure successful implementation of online flipped classrooms.

In addition, it was found in this study that the full online flipped classroom procedures influenced students' development of three types of engagement: affective, behavioral, and cognitive engagement. The students favored watching instructional videos at their own pace as this provided them with enough time to prepare themselves before class. Meanwhile, they engaged in doing assignments during the post-class phase. Their engagement may have resulted from their realization that the course content could benefit their careers after graduation, so the students kept on engaging in the lessons. They continuously watched the videos and did the quizzes every week, putting effort into completing assignments although they were overwhelmed with assignments from other courses as well. This was similar to the results of previous research (Alsowat, 2016; Hung, 2015; Pratawi et al., 2022). However, some students did not like watching the videos before class as they were tired from assignments from other courses. Also, they were used to passive teaching, so they did not want to learn by themselves. This was congruent with a study by Afrilyasanti et al. (2017) who employed the online flipped classroom to teach senior high school students to write essays and reported that some students did not appreciate watching videos before class and they waited for the information given by the teacher at the beginning of the class. During the in-class phase, the students showed that they enjoyed activities using collaborative learning and they agreed that diverse digital platforms facilitated communication during class and out of class. Relevant materials and collaborative activities reflected the students' substantial efforts. This could be observed from the students' attentive approach to completing all of the tasks enthusiastically—they put in considerable effort to complete tasks even though practicing online was not convenient. This was in the same vein as the work of Hung (2022) who investigated 120 tertiary Vietnamese students' perceptions of the activities in an online flipped classroom. Moreover, the positive rapport between the teacher and students influenced affective, behavioral, and cognitive engagement. Most of the activities in the during-class phase were group works, so the students felt comfortable studying with their friends and the teacher. When they enjoyed

studying and kept practicing, they should be able to achieve their learning goals, which, in turn, led to development of confidence in speaking and writing, as has been confirmed by previous studies (e.g., Evseeva & Solozhenko, 2015; Li & Wang, 2023). These reasons help explain why the students had positive engagement with the full online flipped classroom instruction model implemented in this study.

6. Implications of the Findings

This study suggests practical implications for teachers and educators, advocating the integration of asynchronous tools such as recorded videos and quizzes to enhance pre-class meeting skills. Teachers should carefully decide what content should be taught with videos lasting between 10 and 15 minutes. In addition, teachers should create interactive videos using services such as Edpuzzle and MOOC to sustain student engagement. This means that teachers need to master IT skills, especially video editing, and use a selected teaching platform that is user-friendly and convenient for students to access. To promote collaborative learning during the in-class phase, teachers should create active learning activities based on what the students have learned from the pre-class phase. Group discussions and problem-solving tasks that are suitable for the students' background knowledge and their learning styles should be adopted. Before the student orientation, teachers should plan carefully what students need to be informed of at the beginning of the course, e.g., course content, course objectives, self-study management, and what to do when the full online flipped classroom is used. Understanding these elements can help eliminate students' confusion when adopting the new method and encourage student engagement. Besides, the course content should meet the needs of the students; they will put effort into completing the tasks as they realize the importance of the course, meaning a high level of engagement. As regards provision of meaningful and insightful feedback, teachers should ask students to write a student log to reflect on what they have learned and the problems they have encountered during the practice in the online flipped classroom, as suggested by Goh and Burns(2012). Then, the teachers should be

better able to provide them with necessary feedback. In addition, the results revealed that students required more note-taking activities and listening practice. Therefore, it is recommended that teachers who wish to adopt the full online flipped classroom allocate more time for these activities and create more meaningful note-taking and listening tasks. Last but not least, it was found in this study that students required class support, especially during feedback sessions. Therefore, teachers should monitor group activities in the breakout room in Zoom. However, teachers need to be aware that these activities can be time-consuming as students have to wait for the teacher for an extended period. Thus, team teaching could help reduce the workload of teachers and the amount of student wait time.

7. Limitations and Recommendations

The findings of this study revealed the effectiveness of the full online flipped classroom instruction model leading to students' improvement in terms of meeting skills and learning engagement. However, the study encountered inherent limitations. This study measured positive student engagement through the use of a questionnaire and interviews. Future research could incorporate specific instruments like the Intrinsic Motivation Inventory's enjoyment subscale and tallying student participation, as suggested by Jia et al. (2023) to enhance precision. Additionally, it would be useful to identify the most effective means of delivering meaningful feedback and to explore the impact of integrating technology in feedback delivery. This could possibly be done by comparing students' perceptions of receiving different types of feedback on their performance such as explicit correction, recast, clarification requests, and metalinguistic feedback.

8. Conclusion

This study created a full online flipped classroom instructional model in response to the increasing role of technology in language instruction. The results revealed the effectiveness of the model, as it enhanced student oral and written

meeting skills and provided a high level of behavioral, affective, and cognitive engagement. The results of this study proved that teaching using the full online flipped classroom is useful and convenient as it makes the virtual classroom similar to the physical one. However, several points need to be taken into consideration to maximize the benefits of a full online flipped classroom such as the time-consuming nature of creating attractive videos and teaching materials, design of collaborative activities, and provision of constructive and meaningful feedback for students.

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