



Academic Reading Comprehension and Students' Attitudes toward Flipped Classroom Instruction among Graduate Students in Thailand

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Abstract

Academic reading comprehension is essential for graduate students; however, many learners experience difficulties in understanding complex academic texts. The flipped classroom approach has been proposed as a learner-centered instructional strategy that promotes active learning and learner autonomy. This study aimed 1) to compare graduate students' academic reading comprehension before and after instruction using a flipped classroom approach, and 2) to investigate their attitudes toward the instructional method. The sample consisted of 36 graduate students enrolling in the first semester of the academic year 2025 at a government university, selected through cluster random sampling. A one-group pretest-posttest design was employed to examine changes in academic reading comprehension after an eight-week instructional intervention. The research instruments included eight lesson plans, an academic reading comprehension test, and an attitude questionnaire. The results showed that the mean posttest score ($\bar{X} = 24.42$, $SD = 1.66$) was significantly higher than the mean pretest score ($\bar{X} = 14.36$, $SD = 3.80$), $t(35) = 18.76$, $p < .01$. In addition, students expressed positive attitudes toward the flipped classroom approach ($\bar{X} = 4.30$, $SD = 0.87$). The findings reveal the evidence that the flipped classroom approach at a graduate-level English language learning context can contribute to improvements in academic reading comprehension and promote positive learning attitudes among graduate students.

Keywords: academic reading comprehension, autonomous learning, EFL learners, flipped classroom, Thai higher education

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Introduction

The increasing significance of English proficiency within higher education relates directly to an individual's ability, particularly for graduate students, to interact with academic literature and engage in academic discourse while at the same time effectively communicating in both international and academic/professional settings. Within Thailand, English proficiency has been determined to be an essential competency for attaining a higher education. Many Thai universities have adopted the Common European Framework of Reference for Languages (CEFR) as their standard which measures an individual's language proficiency. In Educational Administration programs, the ability to read and understand academic texts written in English is crucial as the majority of the latest literature in the field of educational leadership, policy, and administration is published in the English language.

Academic reading comprehension involves the ability to make sense of academic texts using cognitive and metacognitive strategies, including the identification of main ideas and making inferences, the evaluation of arguments, the integration of information across texts, and critically interpreting disciplinary knowledge (Grabe & Stoller, 2020; Koda, 2022). In contrast to general reading, academic reading requires the reader to process fairly complicated vocabulary, large amounts of information presented in a very (or relatively) similar format, and the conventions that are specific to their discipline's discourse. Research conducted in the field of applied linguistics has indicated that academic reading comprehension is a major aspect of academic literacy and that it is positively correlated with a student's academic success in post-secondary education (Grabe & Stoller, 2020; Nation, 2019).

While there has been a rise in the significance of academic literacy, there are reports from previous studies revealing that a high number of Non-Native English speakers (EFL) have issues processing and understanding scholarly documents due to their limited vocabulary knowledge, insufficient background information, and lack of effective reading methodology (Alghamdi, 2023; Koda, 2022). However, graduate students cannot be expected to learn similarly since they have different experiences, backgrounds and levels of proficiency in languages. Therefore, teaching methods that offer flexibility, independence, and active engagement will be more beneficial in supporting their improvement in academic reading.

Flipped classroom is one of innovative pedagogical models employed in the English language learning and teaching across the world of higher education. Students learn through different modalities (e.g., online videos, digital readings, etc.) before coming into the classroom and then engage in collaborative learning, discussion, problem-solving and application activities during class (Bergmann & Sams, 2012). This model aligns well with Knowles' (1980) theory of Adult Learning, which supports self-directed learning, learner autonomy, and active participation in the learning process. The flipped classroom provides learners with a greater sense of responsibility for

their learning by moving the acquisition of foundational contents outside the classroom and maximizing opportunities to interact and create knowledge in class.

There are numerous advantages to using the flipped classroom instruction in an EFL environment as outlined in previous studies. According to research, using this technique has increased learner motivation, engagement, autonomy, and academic success (Alghamdi, 2023; Lo & Hew, 2017; Zainuddin et al., 2019). In terms of reading-related situations, the flipped instruction allows for greater collaboration among learners when creating meaning and provides opportunities for learners to participate more actively in their reading activities (Turan & Akdag-Cimen, 2020). However, there are some inconsistencies of implementing the flipped classroom. For example, research points out that flipped classroom instruction may present challenges including student preparation prior to class being inadequate, more work for teachers and students involved, and obstacles due to technology or varying readiness levels of students for self-directed learning, (Lo & Hew; Zainuddin et al., 2017). These findings indicate that learner characteristics, instructional design, and the education context itself affect how well the flipped classroom instruction works.

Although a growing body of research has investigated the flipped classroom instruction in EFL education, several gaps still remain and need to be further explored. First, much of the existing research has focused on undergraduate students, general English courses, or language skills such as speaking and writing. Second, relatively few studies have investigated the use of the flipped classroom instruction for developing academic reading comprehension among graduate students. Third, limited evidence is available from the Thai higher education context, particularly among Educational Administration students whose academic success depends heavily on their ability to engage with scholarly texts. Therefore, the present study extends previous research by examining the implementation of a flipped classroom approach to enhance academic reading comprehension among graduate students at a government university in the Northeast of Thailand. In addition, it investigates students' attitudes toward this instructional approach in order to provide further evidence regarding the pedagogical value of flipped learning in graduate-level EFL education.

Literature Review

This study is informed by three interconnected areas of scholarship, namely academic reading comprehension, Adult Learning Theory, and flipped classroom pedagogy. These concepts are closely related because academic reading comprehension requires learners to engage in higher-order cognitive processes while adult learning theory emphasizes learner autonomy and self-directed learning. The flipped classroom approach operationalizes these principles by providing opportunities for independent learning before class and collaborative knowledge construction during class. Therefore, understanding the relationships among these concepts is essential for examining the effectiveness of flipped classroom instruction in graduate-level academic reading contexts.

1. Academic Reading Comprehension

Academic reading comprehension is a challenging task in which readers have to construct meaning out of academic texts and use both cognitive and metacognitive strategies. In the context of academic reading, these strategies include identifying main ideas, making inferences, evaluating arguments, synthesizing information, and using prior knowledge to complete the reading task. (Grabe & Stoller, 2020; Koda, 2022) Academic reading requires the use of vocabulary that is particular to each discipline, complex syntactic structures that are typical of academic writing, and discipline-based conventions for constructing texts.

The research findings about reading a second language show that both linguistic ability and how a person uses reading strategies will dictate how well they can read for academic purposes. Nation (2019) notes that vocabulary knowledge is a major factor in helping a person understand what they read in a text, while Grabe and Stoller (2020) argue that strategic processing and critically thinking about the texts are just as important. In addition, Koda (2022) states that good readers are constantly checking their understanding while reading, connecting the information in the text to their own knowledge base, and using metacognitive strategies to solve their reading problems.

Researchers on EFL reading contexts have always found difficulties in the academic reading comprehension processes. Vocabulary deficiency, insufficient background knowledge and insufficient reading strategies often trouble EFL learners in understanding academic texts (Alghamdi, 2023). Furthermore, current findings suggest that strategies with active learning and cooperation contribute to reading comprehension performance (Zhang & Zou, 2024). These findings indicate that academic reading development requires instructional environments that support both independent learning and higher-order cognitive processing.

2. Adult Learning Theory and Learner Autonomy

Adult Learning Theory or andragogy, conceptualized by Knowles (1980) has given a basis for explaining the way adults learn. The theory suggests that adults are typically self-directed and need to have learning tasks that will meet personal and work needs for it to become of relevance to them. They use their past experience as a resource in the building of new knowledge.

Further study has developed these assumptions by incorporating the importance of reflection, experience and social interaction to learning in adults (Merriam, 2001; Merriam & Bierema, 2014). One key construct in adult learning is that of the autonomy of the learner (defined by Benson (2013) as the ability of learners to take responsibility for planning, monitoring and evaluating their own learning), which has long been understood as being vital for success in language learning, fostering the qualities of self-regulation, strategic learning behavior and the ability to engage in lifelong learning.

Learner autonomy in reading instruction allows the student to take control of their reading rate, choose strategies that suit their needs, and independently monitor how well they understand what they read. Studies show that learners who are autonomous are more engaged in their learning than those who depend on instructor-led instruction (Benson, 2013; Teng & Zhang, 2020), therefore instructional methods that promote learner autonomy may positively influence graduate students' development of academic reading skills.

3. Flipped Classroom Approach

Over the recent decade, the flipped classroom instructional model has emerged as a widely utilized approach in higher education. Using this method, learners study instructional materials (video, readings or digital learning resources) prior to class; in-class time is reserved for interactive learning activities such as discussion, collaboration, and problem-solving (Bergmann & Sams 2012).

A growing body of research has reported positive outcomes associated with flipped classroom instruction. Systematic reviews conducted by Lo and Hew (2017) and Zainuddin et al. (2019) found that flipped learning can improve student engagement, motivation, autonomy, and academic achievement across various educational settings. In EFL contexts, recent studies have shown that the flipped instruction promotes greater learner participation and supports language skill development by increasing opportunities for active learning (Alghamdi, 2023; Zhang & Zou, 2024).

With regard to reading comprehension, the flipped classroom instruction appears particularly promising because students can engage with texts prior to class and use classroom time to discuss interpretations, clarify misunderstandings, and participate in higher-order analytical activities. Hasanah and Arifani (2018) reported improvements in reading comprehension performance among EFL learners exposed to the flipped instruction. Similarly, Turan and Akdag-Cimen (2020) found that flipped learning enhanced students' critical reading and collaborative learning experiences.

However, the literature also reveals several limitations of the flipped classroom approach. Lo and Hew (2017) and Zainuddin et al. (2019), for examples, noted that learners who fail to complete pre-class activities may experience difficulties participating in in-class discussions and collaborative tasks. These findings suggest that although the flipped classroom instruction offers substantial benefits, its success is influenced by contextual and learner-related factors.

4. Conceptual Relationship among Academic Reading, Adult Learning, and Flipped Classroom Instruction

The present study integrates academic reading comprehension, adult learning theory, and flipped classroom pedagogy into a unified conceptual framework. Academic reading comprehension

requires learners to engage in higher-order thinking processes such as analysis, synthesis, evaluation, and interpretation. Adult learning theory suggests that these processes are facilitated when learners are provided with opportunities for autonomy, self-direction, and meaningful engagement. The flipped classroom operationalizes these principles by enabling students to interact with learning materials independently before class, and engage in collaborative, cognitively demanding activities during class.

Therefore, the flipped classroom approach may provide an effective instructional environment for enhancing graduate students' academic reading comprehension by promoting learner autonomy, active participation, and higher-order thinking. This theoretical relationship forms the foundation of the present study and supports the investigation of both reading comprehension outcomes and students' attitudes toward the flipped classroom instruction.

Research Objectives

The study is guided by two research objectives comprising:

1. To compare graduate students' academic reading comprehension ability before and after learning through the flipped classroom approach
2. To investigate graduate students' attitudes toward the flipped classroom approach for developing academic reading comprehension

Methodology

1. Research Design

This study employed a quantitative pre-experimental research design using a one-group pretest–posttest model. The design was selected to examine the effectiveness of the flipped classroom approach in improving graduate students' academic reading comprehension. Although the one-group pretest–posttest design is appropriate for examining changes in participants' performance over time, it has several limitations. The absence of a control group may expose the study to threats to internal validity, including maturation, testing effects, and external influences occurring during the intervention period. Therefore, the findings should be interpreted as evidence of improvement associated with the instructional intervention rather than definitive proof of causality.

2. Participants and Sampling

The participants consisted of 36 graduate students enrolling in the Educational Administration Program at the government university in the Northeast of Thailand during the first semester of the academic year 2025. The participants were selected through cluster random sampling. One intact class was selected from the available graduate student cohorts and all students in the selected class willingly participated in the study. The participants were adult learners with diverse professional backgrounds, including school administrators, teachers, and educational personnel. Their ages ranged from approximately 25 to 55 years. In addition, all participants were studying English as a

Foreign Language (EFL) and were required to develop academic reading skills to support their graduate-level studies.

3. Research Instruments

3.1 Flipped Classroom Lesson Plans

Eight lesson plans were developed based on the principles of the flipped classroom approach and adult learning theory. The instructional intervention was implemented over eight weeks, with one three-hour session per week, resulting in a total of 24 instructional hours. Each lesson plan was organized into three phases: pre-class, in-class, and post-class activities. During the pre-class phase, students engaged with instructional videos, academic reading passages, vocabulary exercises, and guiding questions through online learning platforms to prepare for classroom learning. The in-class phase emphasized active learning through collaborative discussions, text analysis, problem-solving activities, and critical reading tasks designed to promote higher-order thinking and deeper comprehension of academic texts. In the post-class phase, students participated in reflective activities and learning consolidation tasks to reinforce their understanding. The content validity of the lesson plans was evaluated by three experts in TESOL and English language teaching using the Index of Item-Objective Congruence (IOC), with all components achieving IOC values ranging from 0.67 to 1.00, indicating acceptable content validity.

3.2 Academic Reading Comprehension Test

The academic reading comprehension test was developed to assess students' ability to comprehend academic texts in English and was aligned with CEFR B2-level reading descriptors. The test consisted of 30 multiple-choice items based on four academic reading passages and measured three key academic reading skills including identifying main ideas (10 items), making inferences (10 items), and interpreting and evaluating information (10 items). Each correct answer was marked one point, resulting in a maximum score of 30 points. Prior to its administration, the test was piloted with graduate students who possessed characteristics similar to those of the target population but were not included in the main study. Item analysis indicated that the difficulty indices ranged from 0.33 to 0.56, while the discrimination indices ranged from 0.21 to 0.93, demonstrating acceptable item quality. The content validity of the test was evaluated by three experts using the Index of Item-Objective Congruence (IOC), with values ranging from 0.67 to 1.00. Reliability was determined using the Kuder–Richardson Formula 20 (KR-20), yielding a coefficient of 0.88, which indicated a high level of internal consistency.

3.3 Attitude Questionnaire

A questionnaire was developed to investigate students' attitudes toward the flipped classroom approach for developing academic reading comprehension. The instrument consisted of 20 five-point Likert-scale items ranging from 1 (strongly disagree) to 5 (strongly agree) and was organized

into three dimensions: learning engagement, learner autonomy, and perceived effectiveness of the flipped classroom approach. Sample items included the flipped classroom approach increased my engagement in reading activities, the pre-class learning materials helped me prepare for classroom discussions, and the flipped classroom approach improved my academic reading comprehension. The content validity of the questionnaire was evaluated by three experts using the Index of Item-Objective Congruence (IOC), with values ranging from 0.67 to 1.00, indicating acceptable content validity. Prior to its use in the main study, the questionnaire was piloted with participants who possessed characteristics similar to those of the target population. Reliability was determined using Cronbach's alpha, yielding a coefficient of 0.91, which indicated excellent internal consistency.

4. Instructional Intervention

The flipped classroom intervention was implemented over eight consecutive weeks. Prior to each lesson, students accessed instructional materials through Google Classroom, including video lectures, academic reading passages, vocabulary activities, and comprehension questions designed to prepare them for in-class learning. Student participation in pre-class activities was monitored through assignment completion records and online submissions. During classroom sessions, students engaged in active learning activities such as collaborative discussions, peer interaction, critical reading tasks, and instructor-guided feedback aimed at promoting deeper comprehension of academic texts and higher-order thinking skills. The instructional design was guided by adult learning theory, which emphasizes learner autonomy, self-directed learning, and active engagement in meaningful learning experiences, thereby supporting the development of academic reading comprehension through both independent and collaborative learning processes.

5. Data Collection Procedures

Data collection was conducted in four stages. First, participants completed the academic reading comprehension pretest within 60 minutes to assess their baseline reading ability. Second, the flipped classroom intervention was implemented over eight weeks using the developed lesson plans. Third, participants completed the posttest using the same academic reading comprehension test within 60 minutes to measure changes in their reading performance. Finally, participants completed the attitude questionnaire to evaluate their perceptions of the flipped classroom approach for developing academic reading comprehension. The collected data were analyzed using both descriptive and inferential statistics.

6. Data Analysis

The collected data were analyzed using both descriptive and inferential statistics with the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, including mean ($\bar{X}$), percentage, and standard deviation (SD), were used to summarize students' academic reading comprehension performance and attitudes toward the flipped classroom approach. To determine whether students' posttest performance met the expected level of achievement, a one-sample t-test

was conducted by comparing the mean posttest score with the predetermined criterion of 70 percent. The 70 percent criterion was established based on the university's standard for satisfactory academic achievement and has been commonly adopted in educational research in Thailand as an indicator of acceptable learning outcomes. In addition, a paired-samples t-test was employed to compare students' academic reading comprehension scores before and after the instructional intervention in order to examine the effectiveness of the flipped classroom approach. Statistical significance was established at the .05 level. To determine the magnitude of the instructional effect, Cohen's *d* was calculated and interpreted according to Cohen's (1988) guidelines, where 0.20 indicates a small effect, 0.50 a medium effect, and 0.80 or above a large effect.

Students' attitudes toward learning academic reading comprehension through the flipped classroom approach were analyzed using mean ($\bar{X}$) and standard deviation (*SD*). The interpretation of attitude scores followed the criteria proposed by Saiyos and Saiyos (2000), which have been widely used in Thai educational research for interpreting five-point Likert-scale responses. The mean scores were interpreted as follows: 4.50–5.00 = Very High, 3.50–4.49 = High, 2.50–3.49 = Moderate, 1.50–2.49 = Low, and 0.50–1.49 = Very Low.

Results

The results of this study revealed the effects of the flipped classroom approach on graduate students' academic reading comprehension. The findings are presented as follows:

1. Results of Graduate Students' Academic Reading Comprehension Using the Flipped Classroom Approach (Objective 1)

The individual results of the pretest and posttest scores of students' English reading comprehension ability before and after the instruction are presented in Table 1.

Table 1

Results of Academic Reading Comprehension Using a Flipped Classroom Approach

Student	Pretest		Posttest	
	Score (30 scores)		Score (30 scores)	
	Score	Percentage	Score	Percentage
1	12	40.00	23	76.67
2	10	33.33	23	76.67
3	23	76.67	27	90.00
4	16	53.33	26	86.67
5	15	50.00	24	80.00
6	16	53.33	24	80.00
7	19	63.33	26	86.67
8	19	63.33	25	83.33
9	12	40.00	23	76.67
10	12	40.00	22	73.33

Table 1 (Continued)

Student	Pretest		Posttest	
	Score (30 scores)		Score (30 scores)	
	Score	Percentage	Score	Percentage
11	11	36.67	21	70.00
12	22	73.33	28	93.33
13	15	50.00	24	80.00
14	14	46.67	24	80.00
15	10	33.33	24	80.00
16	13	43.33	23	76.67
17	20	66.67	28	93.33
18	15	50.00	27	90.00
19	9	30.00	22	73.33
20	17	56.67	24	80.00
21	12	40.00	25	83.33
22	15	50.00	23	76.67
23	16	53.33	24	80.00
24	15	50.00	25	83.33
25	15	50.00	24	80.00
26	16	53.33	24	80.00
27	13	43.33	23	76.67
28	8	26.67	27	90.00
29	9	30.00	25	83.33
30	20	66.67	26	86.67
31	17	56.67	24	80.00
32	12	40.00	23	76.67
33	13	43.33	25	83.33
34	11	36.67	23	76.67
35	8	26.67	25	83.33
36	17	56.67	25	83.33
$\bar{X}$	14.36	47.87	24.42	81.39
<i>SD</i>	3.80		1.66	

Table 1 presents the pretest and posttest scores of graduate students' academic reading comprehension. The results showed that the mean pretest score was 14.36 (47.87%), whereas the mean posttest score increased to 24.42 (81.39%). The standard deviation decreased from 3.80 in the pretest to 1.66 in the posttest, indicating less variation in students' performance after the instructional intervention.

2. The Comparison of the Students' English Reading comprehension ability using the flipped classroom approach before and after the instruction with the set criteria of 70 percent.

The comparison of the students' English reading comprehension ability of 36 students after the instruction meets the predetermined criterion of 70 percent. The one sample t-test was used to compare students' English reading comprehension ability as shown in Table 2.

Table 2

Comparison of Students' Academic Reading Comprehension after Instruction with the 70% Criterion

Posttest	Criterion of 70 percent (21 points)			
	$\bar{X}$	Percentage	<i>df</i>	<i>t</i>
	24.42	81.39	35	18.76**
The set criterion	21	70		
** $p \leq .01$				

Table 2 presents the comparison between students' posttest scores and the predetermined criterion of 70% (21 points). The results of the one-sample t-test indicated that the mean posttest score ($\bar{X} = 24.42$) was significantly higher than the criterion score, $t(35) = 18.76$, $p < .01$.

3. The results of the comparison of scores on English reading comprehension ability before and after studying English reading comprehension using the flipped classroom approach.

The results of the comparison of scores on English reading comprehension ability before and after studying English reading comprehension using the flipped classroom approach of graduate students using t-test for dependent samples are shown in Table 3.

Table 3

Mean, Standard Deviation, and Percentage of Pretest and Posttest Scores of Academic Reading Comprehension

Test	<i>n</i>	$\bar{X}$	<i>S.D.</i>	<i>t</i>
Pretest	36	14.36	3.80	18.76**
Posttest	36	24.42	1.66	
** $p \leq .01$				

Table 3 presents the comparison of graduate students' academic reading comprehension scores before and after the instructional intervention. The results showed that the mean posttest score ($\bar{X} = 24.42$, $SD = 1.66$) was significantly higher than the mean pretest score ($\bar{X} = 14.36$, $SD = 3.80$) at the .01 level. In addition, the effect size of 0.52 indicates the medium magnitude of the observed improvement.

4. Results of Students' Attitudes towards the Flipped Classroom Approach in Enhancing Academic Reading Comprehension (Objective 2)

After the instruction using eight lesson plans, an attitude questionnaire consisting of 20 question items was conducted. The results of the students' attitude survey were shown in Table 4.

Table 4

Students' Attitude towards the Flipped Classroom

No.	Attitude Item	$\bar{X}$	SD	Interpretation
1	Learning through the flipped classroom helps me understand lessons better because I can preview them before class.	4.51	0.68	Very high
2	I am always motivated in learning because the teacher organizes learner-centered activities.	4.67	0.58	Very high
3	Video clips and PowerPoint slides help me understand the reading text better.	4.38	0.71	High
4	I clearly understand how to do assignments through the teacher's online instructions.	4.51	0.6	Very high
5	Searching for unfamiliar vocabulary helps me understand the reading text better.	4.82	0.39	Very high
6	After reading at home, I can identify the main idea and supporting details.	4.64	0.63	Very high
7	I can create questions related to the reading text after reading.	4.41	0.85	High
8	I become more interested in reading after the teacher activates my background knowledge and asks questions.	4.72	0.56	Very High
9	Sharing vocabulary knowledge with friends in class helps me understand meanings and answer worksheet questions.	4.77	0.43	Very high
10	Dividing students into groups of four with mixed abilities helps us work harmoniously and answer reading questions faster.	4.54	0.72	Very high

Table 4 (Continued)

No.	Attitude Item	$\bar{X}$	<i>SD</i>	Interpretation
11	I understand the reading text better after the teacher explains unclear parts.	4.77	0.43	Very high
12	Group exercises such as gap-filling or matching help me understand the reading text better.	4.77	0.43	Very high
13	I can retell details of the text after reading and doing exercises.	4.49	0.72	High
14	I can answer comprehension test questions in English reading.	4.46	0.79	High
15	I can summarize the text and create a mind map or illustration.	4.46	0.79	High
16	Flipped classroom does not help me understand reading at different levels (literal, inferential, critical).	3.49	1.62	Moderate
17	The method is not interesting because it involves too many steps and activities.	3.36	1.66	Moderate
18	I feel stressed when I do not understand the reading text.	3.62	1.52	High
19	Creating post-learning projects is too complex for me.	3.49	1.62	Moderate
20	The flipped classroom method is not suitable for graduate students.	3.18	1.75	Moderate
Overall		4.30	0.87	High

Table 4 presents the overall attitudes of graduate students toward the flipped classroom approach for developing academic reading comprehension. The overall mean score was 4.30 ($SD = 0.87$), which was interpreted as a high level according to the established criteria.

Overall, the results showed higher posttest scores than pretest scores in academic reading comprehension. The posttest mean score also exceeded the predetermined criterion of 70%. Furthermore, graduate students reported high levels of attitudes toward the flipped classroom approach for developing academic reading comprehension.

Discussion

The findings of this study indicated that graduate students demonstrated higher academic reading comprehension scores after participating in the flipped classroom intervention. The posttest mean score ($\bar{X} = 24.42$, 81.39%) was substantially higher than the pretest mean score ($\bar{X} = 14.36$, 47.87%) and exceeded the predetermined criterion of 70%. Although the one-group pretest–posttest design does not permit strong causal conclusions, the findings suggest that participation in the flipped classroom learning environment was associated with improvements in students' academic reading comprehension.

One possible explanation for the observed improvement relates to the characteristics of graduate students as adult learners. Adult learning theory proposes that adults tend to learn more effectively when they are provided with opportunities for self-direction, autonomy, and meaningful engagement with learning tasks (Knowles, 1980; Knowles et al., 2015). In the present study, students were required to engage with academic reading materials before class, allowing them to learn at their own pace and prepare for subsequent classroom activities. This instructional structure may have supported learners' autonomy and encouraged greater responsibility for their own learning. Consequently, classroom time could be devoted to discussion, clarification, and deeper engagement with academic texts.

The findings are consistent with previous research reporting positive relationships between the flipped classroom instruction and language learning outcomes. For example, Lo and Hew (2017) and Zainuddin et al. (2019) found that flipped learning environments often promote learner engagement, self-regulation, and active participation. Similarly, Hasanah and Arifani (2018) reported improvements in reading comprehension among EFL learners who participated in flipped learning activities. The findings of the present study extend this body of literature by suggesting that the flipped classroom instruction may also be beneficial in graduate-level academic reading contexts, where learners are expected to engage with complex texts and higher-order comprehension processes.

Another possible factor contributing to the observed improvement was the integration of collaborative learning activities during classroom sessions. Previous studies have suggested that discussion, peer interaction, and collaborative meaning-making can facilitate deeper comprehension of academic texts (Grabe & Stoller, 2020; Turan & Akdag-Cimen, 2020). In the present study, students participated in the group discussion and critical reading tasks that required them to analyze information, interpret arguments, and exchange perspectives. Such activities may have supported the development of higher-order reading skills beyond literal comprehension.

The results also revealed that students reported high levels of positive attitudes toward the flipped classroom approach. The findings are consistent with previous studies indicating that learners often appreciate the flexibility, accessibility, and learner-centered nature of flipped learning

environments (Alghamdi, 2023; Zainuddin et al., 2019). The opportunity to access instructional materials before class and revisit learning resources as needed may have contributed to students' favorable perceptions. Furthermore, the combination of independent preparation and interactive classroom activities may have increased learners' confidence and engagement with academic reading tasks.

Despite these positive findings, some limitations should be acknowledged. First, the study employed a one-group pretest–posttest design without a control group. Therefore, it is not possible to conclude definitively that the observed improvements resulted solely from the flipped classroom intervention. Other factors, such as maturation, testing effects, or external learning experiences, may have influenced the outcomes. Second, the study was conducted with a relatively small sample of graduate students from a single university, which may limit the generalizability of the findings to other educational contexts. Third, the study relied primarily on quantitative measures and did not include qualitative data which could provide deeper insights into students' learning experiences and perceptions.

Given these limitations, future research should employ more rigorous experimental or quasi-experimental designs that allow comparison groups. Studies involving larger and more diverse samples from different institutions would also help strengthen the generalizability of the findings. Additionally, incorporating qualitative methods such as interviews or focus groups may provide a more comprehensive understanding of how the flipped classroom instruction influences academic reading comprehension and learner engagement.

Overall, the findings suggest that the flipped classroom approach may provide a promising instructional environment for supporting graduate students' academic reading comprehension and fostering positive attitudes toward learning. However, the results should be interpreted cautiously in light of the study's methodological limitations.

Conclusion

This study investigated the use of the flipped classroom approach for developing academic reading comprehension among graduate students at the government university in the Northeast of Thailand and examined their attitudes toward the instructional approach. The findings indicated that students achieved higher scores on the posttest than on the pretest, and their posttest performance exceeded the predetermined criterion of 70 percent. In addition, the participants reported positive attitudes toward the flipped classroom approach, with the overall attitude score being at a high level.

The findings suggest that the flipped classroom approach may provide a supportive learning environment for academic reading development in graduate-level EFL contexts. Consistent with the principles of adult learning theory, the instructional design allowed learners to engage with learning materials prior to class and participate in interactive learning activities during class. Such

opportunities may support active engagement with academic texts and facilitate the development of higher-order reading processes, including analysis, interpretation, and critical evaluation.

Although the study contributes to the growing body of research on flipped classroom instruction in EFL higher education by providing evidence from a graduate-level academic reading context, the findings should be interpreted with caution due to the limitations. The study employed a one-group pretest–posttest design without a control group, which limits the ability to establish causal relationships between the instructional intervention and the observed outcomes. In addition, the study was conducted with a relatively small sample from a single graduate program, which may restrict the generalizability of the findings to other educational contexts.

Recommendations

Based on the findings of this study, several recommendations can be proposed. The results indicated that students' posttest scores exceeded the predetermined 70% criterion and were significantly higher than their pretest scores, demonstrating a substantial improvement in academic reading comprehension. Therefore, English teachers are encouraged to adopt the flipped classroom approach as an effective active learning strategy to enhance students' reading abilities, including textually explicit, implicit, and critical comprehension. Additionally, students showed positive attitudes toward the flipped classroom approach, suggesting that it effectively promotes engagement both inside and outside the classroom. Pre-class activities help activate prior knowledge, while in-class activities foster collaborative learning and peer support; thus, teachers are encouraged to provide varied and alternative learning materials to better prepare students for interactive classroom participation. For further research, it is recommended that future studies should employ experimental or quasi-experimental designs with comparison groups to explore the use of the flipped classroom approach in developing other English language skills such as speaking, listening, and writing, apply this approach across different subjects and educational levels, and design new and innovative activities within the flipped classroom framework to further enhance learning outcomes. Moreover, future research should incorporate qualitative methods to gain deeper insights into students' learning experiences and perceptions of flipped classroom instruction.

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