

The Effect of Flipped Classroom Model on Reading Comprehension Achievement of First-Semester Higher Education Students

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ABSTRACT

In response to the limitations of traditional reading instruction, this study explores the impact of the flipped classroom model on the reading comprehension achievement of first-semester English as a Foreign Language (EFL) students in higher education. While previous research has highlighted the benefits of flipped learning in writing instruction, limited empirical studies have examined its effectiveness for reading comprehension, particularly among university-level EFL learners in the Indonesian context. Addressing this gap, the present study employed a quasi-experimental design involving 60 first-semester students at STKIP Muhammadiyah Pagaralam. Participants were divided into two intact classes: an experimental group ($n = 30$) receiving instruction through the flipped classroom model, and a control group ($n = 30$) taught using conventional methods. The instructional intervention spanned 16 meetings. A reading comprehension test served as the research instrument, validated by expert judgment and piloted to ensure reliability (Cronbach's $\alpha = 0.83$). Data were collected through pretests and posttests administered to both groups. Descriptive statistics and independent samples t-tests were used to analyze the data. Results indicated a significant difference in posttest scores between the groups, with the experimental group achieving a higher mean gain (18.5 points) compared to the control group (9.4 points), suggesting the flipped classroom model effectively enhanced reading comprehension. The study implies that integrating pre-class digital content with in-class active learning can significantly improve reading outcomes in EFL contexts. It recommends wider adoption of flipped learning in higher education and encourages further research on long-term impacts and learner engagement strategies.

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INTRODUCTION

The dynamic evolution of educational paradigms in the twenty-first century necessitates the strategic integration of technology into pedagogical methodologies. Traditional instructional approaches, predominantly characterized by teacher-centered knowledge transmission during class time and isolated skill application during homework, increasingly demonstrate inadequacy in addressing the needs of contemporary digitally literate learners (Zainuddin, 2018). This deficiency is acutely evident within language education domains, where complex competencies

such as reading comprehension demand sustained active engagement, sophisticated critical analysis, and individualized instructional scaffolding. For higher education students, reading constitutes a foundational academic skill requiring not merely linguistic decoding proficiency, but the strategic deployment of higher-order cognitive processes including inference generation, information synthesis, and critical evaluation (Oakhill et al., 2014). Conventional pedagogical frameworks, however, frequently constrain valuable in-class time to didactic lectures, relegating the demanding practice of analytical reading to unsupervised independent study (Perfetti et al., 2008). This structural misalignment often results in underdeveloped reading strategies, persistent comprehension challenges, and diminished academic preparedness.

The flipped classroom model offers a transformative approach to teaching by reversing the traditional sequence of instruction. In this model, students receive core instructional materials such as lecture videos, annotated texts, and multimedia content before attending class, typically through digital platforms. This shift enables classroom time to be used for interactive, collaborative, and application-based activities guided by the instructor (Lee et al., 2020). Such a structure supports key educational goals by promoting active learning and higher-order thinking skills. Instead of passively receiving information, students engage in problem-solving, discussions, and analytical tasks that deepen their understanding under the teacher's supervision (Sailer & Sailer, 2021). Additionally, pre-class materials allow students to learn foundational knowledge—such as vocabulary, grammar, and background concepts—at their own pace, which supports individual learning differences (Meyliana et al., 2022). This model also enhances personalized learning, as instructors can focus on coaching students through complex tasks, addressing specific challenges, demonstrating strategies, and providing immediate feedback during class activities (Christiansen et al., 2017).

While substantial empirical research validates the efficacy of the flipped classroom model in enhancing writing instruction within EFL contexts (Christiansen et al., 2017; Gavranović, 2017; Lee et al., 2020; Meyliana et al., 2022; Ramadhani et al., 2019; Sailer & Sailer, 2021; Zainuddin, 2018), its systematic application and evaluation concerning reading comprehension, particularly within higher education settings, remains notably underexplored. Existing studies in EFL environments have predominantly concentrated on writing outcomes (Arifani et al., 2020; Lee et al., 2020; Mirzaei et al., 2022) or involved secondary school populations, offering limited insight into how flipped methodologies impact the development of sophisticated reading skills among university freshmen. This gap is especially critical given the unique challenges confronting first-semester students who must rapidly adapt to the rigorous demands of academic reading in a second language. In the Indonesian context specifically, EFL learners frequently encounter significant hurdles in areas crucial for academic success: complex textual analysis, discipline-specific vocabulary acquisition, inference generation, and sustained critical engagement with scholarly materials (Kaban, 2022). Traditional teaching methods often fail to provide the intensive, guided practice necessary to overcome these hurdles effectively.

The present study directly addresses this research void. Building upon the robust findings (Andewi & Hastomo, 2022; Ramadhani et al., 2019), which demonstrated significant improvements in Indonesian EFL university students' writing achievement through a flipped classroom approach, this investigation seeks to examine the transferability of this model's benefits to the domain of reading comprehension. Specifically, we ask: Can the flipped classroom model, empirically validated for enhancing writing proficiency, produce comparable significant improvements in reading comprehension achievement for first-semester Indonesian EFL students within a higher education context?

This study aims to empirically examine the effect of implementing the flipped classroom model on the reading comprehension achievement of first-semester Indonesian EFL students at STKIP Muhammadiyah Pagaralam, comparing outcomes directly with those attained through conventional teaching methods. By focusing on this critical skill within this specific educational context and population, the research seeks to contribute meaningful insights to the pedagogical

discourse on technology-enhanced language learning and provide evidence-based guidance for curriculum development in Indonesian higher education..

METHOD

Research Design

This study adopted a quasi-experimental research design to investigate the effect of the flipped classroom model on students' reading comprehension at the higher education level (Creswell, 2012). Specifically, it employed a non-equivalent control group pretest-posttest design involving two intact classes of first-semester students at STKIP Muhammadiyah Pagaralam. Due to administrative and practical constraints in educational settings, random assignment of participants to treatment conditions was not feasible. Therefore, the researchers selected two existing classes: one served as the experimental group and the other as the control group. Each class consisted of 30 students, bringing the total number of participants to 60. The experimental group received reading instruction through the flipped classroom approach, while the control group was taught using conventional media such as printed texts and in-class lecturing.

Procedures

The flipped classroom approach in this study required students in the experimental group to engage with reading materials before class. These materials were delivered through video lectures, digital reading passages, and interactive online quizzes. The learning management system used allowed students to access the content via smartphones and laptops, thus accommodating diverse learning preferences and schedules. During the in-class sessions, the instructor facilitated discussions, guided reading practices, and conducted collaborative reading tasks aimed at enhancing comprehension. Conversely, students in the control group were introduced to reading materials during class and assigned follow-up comprehension tasks as homework. This group followed a more traditional pedagogical pattern, where the teacher dominated the instructional process through lectures and question-answer sessions.

The treatment was implemented over 16 meetings across an academic semester. Each meeting lasted 90 minutes and was conducted twice a week. The learning objectives and reading materials for both groups were aligned to ensure fairness in content delivery and learning outcomes. To maintain instructional integrity, the same teacher handled both classes, applying different instructional strategies in accordance with the respective treatment condition. This approach reduced the variability that might occur due to differing teaching styles.

Instrument

The instrument used in this study was a reading comprehension test developed by the researchers based on standardized EFL reading tasks. The test consisted of multiple-choice questions and short-answer items designed to measure students' understanding of main ideas, supporting details, inference, vocabulary, and logical sequencing (Kaban, 2021; Namaziandost et al., 2022; Qiao et al., 2023). The validity of the instrument was examined through expert judgment by two senior lecturers in English Education, while reliability was determined through a pilot study involving 20 students from a different class. The test yielded a Cronbach's alpha of 0.83, indicating high internal consistency.

Data Collection

Data collection procedures began with the administration of a pretest to both the experimental and control groups during the first week of the semester. The pretest scores served as the baseline measure of students' reading ability. Following the 16 sessions of instruction using the respective methods, a posttest was administered to both groups using a parallel form of the reading comprehension test. This posttest aimed to assess any changes in students' reading comprehension performance as a result of the intervention.

Data Analysis

To analyze the data, the researchers used both descriptive and inferential statistics. Mean scores and standard deviations were calculated to describe the performance of students in both groups before and after the intervention. Subsequently, an independent samples t-test was conducted to compare the posttest scores of the experimental and control groups. This analysis determined whether the differences in reading comprehension performance were statistically significant and attributable to the flipped classroom model. Prior to the analysis, normality and homogeneity of variance were tested to ensure the appropriateness of the statistical tests.

Ethical Considerations

Ethical considerations were carefully observed throughout the research process. Ethical clearance was obtained from the institutional review board of STKIP Muhammadiyah Pagaralam before the study commenced. Participation in the study was voluntary, and all participants were informed about the purpose, procedures, potential risks, and benefits of the study. Informed consent was collected from all students, and their identities were kept anonymous in all stages of data collection and reporting. The students were also assured that their participation or non-participation would not affect their grades or academic standing in any way.

FINDINGS AND DISCUSSION

FINDING

This section presents the results of the study on the effectiveness of the flipped classroom model in improving students' reading comprehension. The data were obtained from the pretest and posttest scores of both the experimental and control groups. Each group consisted of 30 first-semester students enrolled in a reading course at STKIP Muhammadiyah Pagaralam. The experimental group was exposed to the flipped classroom model, while the control group received conventional classroom instruction using traditional media and teacher-centered methods.

Table 1. Pretest Results of Students' Reading Comprehension

Group	Number of Students (N)	Pretest Mean	Standard Deviation (SD)	t-value	p-value	Significance
Experimental	30	58.3	6.7			
Control	30	59.1	6.5	-0.49	0.627	Not Significant

At the outset of the study, both groups were given a pretest to determine their initial reading comprehension levels. According to Table 1, the descriptive statistics of the pretest revealed that the mean score for the experimental group was 58.3 (SD = 6.7), while the control group had a mean score of 59.1 (SD = 6.5). The difference between the two groups was minimal and statistically insignificant, as verified by an independent samples t-test ($t(58) = -0.49$, $p = 0.627$). This finding confirmed that both groups had comparable reading comprehension skills before the intervention, thus meeting a key condition for conducting a quasi-experimental study.

Table 2. Posttest Results and Reading Comprehension Gains

Group	Number of Students (N)	Posttest Mean	Posttest SD	Gain Score	t-value	p-value	Significance
Experimental	30	76.8	7.2	18.5			
Control	30	68.5	7.6	9.4	4.56	< 0.001	Highly Significant

After 16 instructional meetings, a posttest was administered to assess the impact of the flipped classroom model on students' reading achievement. According to Table 2, the results showed a noticeable improvement in the performance of the experimental group. The posttest mean score for the experimental group increased to 76.8 (SD = 7.2), while the control group

showed a smaller improvement, with a mean score of 68.5 (SD = 7.6). An independent samples t-test was conducted to compare the posttest scores of the two groups. The results showed a statistically significant difference in favor of the experimental group ($t(58) = 4.56$, $p < 0.001$), indicating that students taught using the flipped classroom model outperformed those in the traditional classroom.

The gain scores (posttest minus pretest) provided additional evidence of the flipped classroom model's effectiveness. The experimental group had a mean gain score of 18.5 points, while the control group had a mean gain of 9.4 points. This substantial difference suggests that the flipped approach was more effective in facilitating students' reading comprehension development. Students in the flipped classroom benefited from exposure to reading materials before class, allowing them to process information at their own pace and come to class prepared for discussion, application, and clarification. In contrast, students in the traditional group relied solely on classroom lectures and teacher explanations during class time, with limited opportunity for self-paced pre-class preparation.

Further qualitative observations supported the quantitative data. During the in-class sessions, students in the experimental group demonstrated higher levels of engagement and participation. Many students were actively involved in discussions and collaborative tasks, likely because they had previewed the materials and were ready to apply their understanding. Classroom observations revealed that students in the flipped classroom were more confident in identifying main ideas, making inferences, and answering comprehension questions. In contrast, the control group often needed more time to comprehend new texts and showed signs of dependence on teacher explanations before attempting comprehension activities.

DISCUSSION

The findings of this study demonstrate that the flipped classroom model has a significant positive effect on the reading comprehension of first-semester students at STKIP Muhammadiyah Pagaralam. The comparison between the experimental and control groups showed a notable difference in posttest performance, with the experimental group achieving significantly higher scores. This supports the growing body of literature that advocates for flipped classroom practices in EFL contexts (Sailer & Sailer, 2021; Stöhr et al., 2020; Vaezi et al., 2019).

Initially, the pretest results showed no statistically significant difference between the two groups, indicating that both began with similar reading proficiency levels. This equivalence strengthened the validity of the post-intervention results, as any significant differences observed in the posttest could reasonably be attributed to the instructional treatment. The flipped classroom model used in this study involved pre-class exposure to reading materials via digital platforms, followed by in-class activities focused on application, discussion, and guided reading tasks. In contrast, the control group relied on conventional, teacher-centered instruction where students received new material during class and were expected to consolidate their understanding independently afterward.

The results from the posttest and gain scores revealed a clear advantage for the experimental group. With a mean gain of 18.5 points compared to only 9.4 points in the control group, the flipped classroom approach nearly doubled the reading improvement of students. This suggests that allowing students to access and explore learning materials before class gave them the opportunity to build foundational understanding at their own pace. Consequently, they arrived in class better prepared to engage in higher-order cognitive tasks such as analysis, inference-making, and synthesis of information. These results are in line with findings which reported that students in flipped learning environments often demonstrate greater readiness and deeper comprehension (Hung, 2018; Tarhan & Öztürk, 2022).

An important aspect that emerged from classroom observations was the increase in student engagement and participation in the experimental group. Students showed enthusiasm in collaborative reading tasks, were more confident in sharing their interpretations, and demonstrated

stronger inferencing and vocabulary strategies. These behaviors can be attributed to the flipped model's emphasis on student-centered learning, which empowers learners to take responsibility for their progress. In contrast, students in the control group frequently relied on teacher explanations and exhibited lower levels of initiative during reading tasks. This difference in classroom dynamics reinforces the pedagogical value of flipped learning in promoting learner autonomy and active engagement (Aybirdi et al., 2023; Tse et al., 2019).

Moreover, the findings also indicate that flipped learning can accommodate diverse learner needs by providing flexible access to materials. Students with varying reading speeds or language proficiency levels could review the pre-class materials multiple times, pause to look up unfamiliar words, and reflect on the content before engaging in in-class tasks. This flexibility is particularly beneficial in EFL contexts where students may face additional challenges due to vocabulary limitations or lack of prior knowledge.

Nevertheless, the study also highlights the importance of careful implementation. The success of the flipped classroom depends not only on the availability of digital content but also on students' willingness to engage with the material independently before class. Teachers must therefore design engaging, accessible pre-class content and establish clear expectations for student accountability. Additionally, institutional support in terms of digital infrastructure and training can significantly influence the effectiveness of such models.

In conclusion, the discussion affirms that the flipped classroom model is a powerful instructional strategy for improving reading comprehension among higher education students. It offers a balanced combination of independent learning and collaborative classroom interaction, leading to more meaningful learning experiences. These findings contribute to the existing literature by providing empirical support for implementing flipped classrooms in Indonesian EFL settings and suggest promising implications for curriculum innovation and teacher training in tertiary education.

CONCLUSIONS

This study investigated the effectiveness of the flipped classroom model in enhancing the reading comprehension achievement of first-semester EFL students at STKIP Muhammadiyah Pagaralam. The results revealed that students in the experimental group, who engaged in pre-class learning and interactive in-class activities, demonstrated significantly higher posttest scores and greater learning gains compared to those in the control group who received traditional instruction. These findings support the growing consensus in EFL pedagogy that technology-enhanced, student-centered learning models like the flipped classroom can foster deeper engagement and better academic outcomes. The study not only confirms the flipped model's potential for supporting higher-order cognitive processes such as inference and critical reading but also highlights its practicality for addressing common challenges in reading instruction, including limited in-class time and diverse student learning needs.

Despite its positive outcomes, this study acknowledges several limitations. The quasi-experimental design and the use of intact classes limit the generalizability of the findings beyond the immediate research context. Furthermore, the study focused only on reading comprehension over a relatively short instructional period and did not account for long-term retention or transfer of skills. Future research is encouraged to explore longitudinal effects of flipped classroom implementation across multiple institutions and subject areas. Additional studies might also examine students' metacognitive strategies, digital literacy levels, and motivational factors in relation to flipped instruction. Finally, to maximize the model's effectiveness, it is essential for educators and institutions to invest in quality digital materials, teacher training, and infrastructure that support autonomous and blended learning environments.

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