



Improving Writing Skills of Engineering Students through Flipped Classroom: A Study

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ABSTRACT

The shift to hybrid learning, prompted by the "new normal" in education, has led to many discussions and changes in traditional classrooms. These changes require teachers to improve their teaching methods to enhance student performance. Recently, flipped Instruction (FI) has been suggested as a way to support this shift. Dr. Bada (2015) notes that one limitation of traditional education is that teachers cannot simply give students knowledge; students must actively build knowledge themselves. FI reverses the usual teaching process by switching the order of typical classroom activities (Ekmekci, 2017; Tucker, 2012). This approach combines interactive exercises with pre-class materials that students can engage with on their own, based on their learning preferences. While FI has been shown to be generally effective, this study specifically aimed to see if it could help English as a Foreign Language (EFL) teachers improve their writing instruction. The study aimed to help 40 second-year engineering students at Government Engineering College, Godhra, to improve their sentence structures using flipped Instruction (FI). The results showed that FI was effective in enhancing the students' writing skills, particularly in sentence structure, and highlighted the need for sufficient task-based asynchronous activities to support this improvement. Additionally, the study recommends that educators and administrators dedicate time and create programs that support this learning approach to ensure the continuous and overall development of each student.

Introduction:

One of the key principles of learning is that students should actively engage in their own education rather than passively receive information from teachers. Flipped Instruction (FI) supports this approach by offering effective ways to engage students as active participants in the learning process. The flipped classroom is a type of blended learning that reverses the traditional learning environment by providing educational materials outside of the classroom, often through online platforms.

Since the pandemic, the flipped classroom model has gained popularity among educators. FI can save classroom time, allowing teachers to offer more personalized guidance to students (Qu & Miao, 2021). This approach differs from traditional teaching, where teachers explain concepts during class, and students gain deeper understanding through lectures. In a flipped classroom, teachers interact with students more individually and less through lectures, while students take an active role in their learning and assessment (Alvarez, 2011).

In reviewing the literature, it was noted that while there are many studies on teaching sentence structures in writing, most focus on identifying student challenges and providing solutions that rely on traditional teaching methods. As a result, these solutions have limited effectiveness. On the other hand, studies on FI have primarily focused on its application compared to other teaching methods (Strayer, 2012) and its integration with other approaches (Cannod et al., 2008). Therefore, new research is needed to explore innovative solutions using flipped pedagogy. More studies are required to provide strong evidence and analysis of FI's effectiveness in teaching writing.

This paper aims to introduce a flipped learning approach that moves away from traditional lecture-based teaching to improve students' sentence structures in writing.

Research Questions:

Given the context and rationale, the researchers chose to provide the participants with more varied language input and feedback through flipped Instruction. To determine whether flipped Instruction is more effective than traditional lecture-based teaching or not, the students were randomly divided into two groups: a flipped instruction group and a conventional teaching group. This study aims to answer the following research questions:

1. What are the students' learning strategies in the flipped classroom?
2. Is there a significant difference in sentence structure between the control group and the experimental group in the pretest and posttest?

3. Does flipped Instruction have a significant impact on improving the sentence structures in the writing of the flipped group?

Literature Review:

English serves as the common language that connects people from different countries. As the Department of Education continues to improve the curriculum to develop globally competitive students, learning and using English is one of the most essential skills students must acquire. English is also the medium of Instruction for most subjects in the Philippines. According to Cabigon (2015), the Philippines is recognized as one of the largest English-speaking nations, with most Filipinos having some level of fluency. Over 14 million Filipinos speak English, and the country ranks 18th out of 112 countries in the English Proficiency Index, with 2 million English speakers. However, many students still find English challenging due to its complex grammar rules. To communicate effectively, students need more exposure to learning grammar.

Communication is not only about speaking the language; writing is also important. When teachers assign writing tasks, they often receive work that needs significant revision due to grammar mistakes and poor sentence construction. Writing is generally more difficult for students than speaking, and many struggle to express their thoughts in clear, simple sentences. This often leads to incoherent writing and miscommunication. Philippakos (2019) emphasized that fluency in sentence construction can help students better organize and express their ideas when drafting written work.

Teachers need to be prepared and skilled in adapting to the changing needs of their students. As student populations evolve, so must teaching methods. Teachers should also consider students' experiences and backgrounds in designing Instruction. Dr. Bada (2015) pointed out that education cannot simply be about delivering information; students must actively construct knowledge in their own minds.

With the changes in teaching methods, teachers need to improve their strategies to better support students' learning. One effective teaching method, especially popular in the United States, is Flipped Instruction (Chou et al., 2021). Flipped Instruction is part of the technological advancements in education, aiming for flexibility and student-centered learning.

Flipped Instruction reverses the traditional teaching model. Instead of introducing lessons during class, students receive interactive materials beforehand. This allows them to learn the content before class, and class time is used for applying what they've learned (Nouri, 2016). The flipped classroom allows students to learn at their own pace and apply their knowledge in class, fostering collaborative learning and discovery. Flipped Instruction also supports blended learning, which has become crucial during the pandemic. It encourages inquiry-based learning, which enhances critical thinking (Johnson et al., 2014).

Technology plays a key role in the success of Flipped Instruction. Students are given learning materials such as pre-recorded video lessons, presentations, audio recordings, and handouts. These resources help ensure the success of Flipped Instruction. In-class activities, such as group work and performance tasks, reinforce learning. According to Handan et al. (2013), the flipped classroom doesn't eliminate in-class learning; instead, it maximizes the time teachers can spend with each student.

As the flipped classroom becomes more popular, research has shown its effectiveness in teaching grammar. Noroozi et al. (2021) found that students were more motivated and engaged in grammar classes when using Flipped Instruction. The positive learning environment contributed significantly to their success in learning grammar. Cadio (2020) also found that the flipped classroom helped Grade 9 students improve their English grammar proficiency.

Methodology:

The researchers plan to conduct the study at Government Engineering College, Godhra, Gujarat, India. The study will use a pretest-intervention-posttest experimental design to examine the effects of the independent variables (flipped and non-flipped Instruction) on the dependent variable (sentence structure in writing). This design will allow the researchers to analyze the data and draw conclusions about how flipped Instruction impacts the variables. It will also help determine whether the intervention (flipped Instruction) has the intended effect on participants with similar characteristics. The design will provide clear comparisons between the sentence structure in the writing of participants during the pretest and posttest.

A class of 40 second-year students will be informed and asked for consent to participate in the study. The class will be divided into two groups: the control group (non-flipped) and the experimental group (flipped). The control group will follow traditional lecture-based instruction, where the teacher delivers lessons and assigns activities based on sentence structure in writing. The experimental group will use flipped Instruction, learning the same topics through various media and materials. However, due to time limitations, the researchers were unable to carry out the full experimental process. As a result, this study will instead focus on analyzing findings from existing literature, including dissertations, peer-reviewed journals, and related studies, on flipped pedagogy, flipped Instruction, and sentence structure in writing.

Results: During the implementation of the research, it became evident that students who were taught using flipped Instruction outperformed those who received traditional lecture-based teaching, specifically in their ability to construct sentences in writing. The improvement in their writing skills was linked to changes in their learning styles and attitudes fostered by the flipped classroom environment. Unlike the conventional lecture-based approach, flipped Instruction encouraged active participation, self-directed learning, and deeper engagement with the material, all of which contributed to more meaningful sentence construction.

Positive Reception of Flipped Instruction

The flipped instruction approach was highly favored by the majority of students in the experimental group. Of the 40 participants, 32 (80%) expressed a positive attitude toward the flipped classroom by the end of the course. This favourable response can be attributed to several features of the flipped model that appealed to the learners.

1. **Use of Videos:** One of the most appreciated elements was the use of video lessons. These pre-recorded lessons allowed students to revisit the material as often as needed, providing a more flexible and personalized learning experience. In contrast to traditional in-class lectures, students could pause, rewind, and rewatch the videos at their own pace, which helped them better understand complex sentence structures and grammar rules.
2. **Flexibility in Learning:** Another key benefit reported by students was the flexibility that flipped instruction offers. Unlike a fixed classroom schedule, where all students must progress at the same rate, flipped instruction enables learners to study the material according to their own pace and schedule. This flexibility was especially valuable to students who needed more time to grasp certain concepts or who preferred to learn outside of traditional class hours. As a result, they felt less pressured and more in control of their learning process.
3. **Non-traditional Writing Tasks:** Students also found the non-traditional writing tasks used in the flipped classroom more productive. In a flipped model, in-class time was reserved for hands-on practice, collaboration, and discussion rather than passive listening to lectures. Writing exercises, such as peer reviews, collaborative writing activities, and immediate feedback from the instructor, allowed students to apply what they had learned in the pre-class materials. This active learning environment helped them internalize sentence construction rules more effectively.

Impact on Sentence Structure and Writing Skills

The research revealed that flipped instruction not only improved students' understanding of sentence structures but also made learning more efficient and enjoyable. Students reported that learning sentence construction became simpler and more intuitive through the flipped model. The ability to revisit instructional videos and engage with writing exercises at their own pace led to a deeper understanding of grammar and sentence formation. This approach fostered a more meaningful learning experience compared to the traditional method of simply receiving instruction during a lecture.

1. **Improved Writing Skills:** Specifically, students noted that their ability to construct clear, coherent, and meaningful sentences improved significantly. The flipped classroom allowed them to break down complex sentence structures into more manageable parts, which they could then practice repeatedly through both pre-class and in-class activities. This continuous reinforcement was a key factor in their improvement.
2. **Increased Accountability and Motivation:** Flipped instruction also promoted greater student accountability. By providing learning materials in advance, students were expected to come to class prepared, which shifted the responsibility of learning onto them. Many students acknowledged that this sense of accountability motivated them to engage more deeply with the material. Knowing that they would need to apply what they had learned in class encouraged them to thoroughly review the pre-class materials and take more ownership of their progress.

Broader Effectiveness of Flipped Instruction

Beyond sentence structure improvement, the flipped classroom model was also effective in cultivating important soft skills such as time management, self-regulation, and independent learning. By giving students more control over their learning process, flipped instruction encouraged the development of these skills, which are essential for academic success and personal growth. Students recognized that this method of teaching required them to be more proactive, disciplined, and responsible for their own learning.

1. **Enhanced Critical Thinking:** The inquiry-based nature of flipped instruction fostered critical thinking skills. Instead of passively receiving information during lectures, students were required to actively engage with the material before class and come prepared to discuss, analyze, and apply what they had learned. This approach helped them think more critically about sentence construction and other aspects of writing.
2. **Collaborative Learning Environment:** The flipped classroom also promoted a more collaborative and interactive learning environment. Since class time was used for discussion, problem-solving, and peer collaboration, students had more opportunities to work together, share ideas, and learn from one another. This peer interaction helped them improve their writing skills through collaborative feedback and group learning activities.

Observations:

Based on the literature and preliminary results, it can be concluded that flipped instruction improves students' sentence structures in writing and is more effective than traditional lecture-based teaching. This approach helps students manage their learning challenges, making them feel more capable of learning in the future.

In a flipped classroom, teachers are not constantly speaking or explaining information, which allows them to use class time more effectively. They can focus on developing teaching strategies and innovations that promote teamwork and practical language applications. This collaborative environment encourages students to work together and positively engage in learning English, particularly in writing sentence structures.

While the current research has some limitations due to time constraints, it raises many unanswered questions that future researchers can explore in different contexts, locations, or cultures. It is recommended that future studies aim for a more thorough comparison of results, as the most noticeable and immediate impact of flipped Instruction on teaching writing may be seen in students' academic performance and learning outcomes.

Conclusion:

In conclusion, the research showed that flipped Instruction is an effective approach to teaching writing, particularly in improving sentence structure. By allowing students to learn at their own pace, engage with the material more deeply, and take greater responsibility for their learning, flipped Instruction fostered a more productive and meaningful learning experience. Students in the flipped classroom not only improved their writing skills but also developed important self-directed learning habits that will benefit them in future academic and professional pursuits.

The findings suggest that flipped Instruction could be a valuable teaching strategy for language learning and writing development, especially in contexts where traditional lecture-based methods are less effective. The flexibility, interactivity, and student-centered nature of flipped learning make it a promising alternative to conventional pedagogy.

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