The Impact of Flipped Instruction on Enhancing Writing Composition Skills Among Computer Engineering Students at Government Engineering College, Dahod

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ARTICLE INFO	ABSTRACT
	This study investigates the efficacy of flipped instruction (FI) in improving writing composition skills among third-semester Computer Engineering students at Government Engineering College, Dahod. Given the increasing importance of effective written communication in the engineering field, and the pedagogical shifts necessitated by modern learning environments, this research explores how FI, by leveraging asynchronous learning and interactive in-class activities, can enhance students' ability to construct coherent and well-structured written outputs. The study will employ a quasi-experimental design, comparing a control group receiving traditional lecture-based instruction with an experimental group engaging in flipped learning. Pre- and post-tests will assess improvements in various aspects of writing composition, such as idea organization, coherence, vocabulary use, and overall sentence and paragraph structure. Anticipated findings suggest that FI will significantly contribute to the development of robust writing composition skills, thereby preparing engineering students for professional communication demands.

1. Introduction

The ability to communicate effectively through writing is an indispensable skill in today's interconnected world, extending its importance even to technical fields like Computer Engineering. For aspiring computer engineers, strong writing composition skills are crucial for technical documentation, research papers, project reports, and professional correspondence. However, traditional educational approaches often struggle to foster these skills adequately in technical disciplines, where the focus typically leans towards theoretical knowledge and practical application, sometimes sidelining the nuances of effective written expression. The perception that English, with its intricate grammar rules, is a complicated language further compounds this challenge for many students.

In response to evolving educational landscapes, particularly the shift towards hybrid learning environments and the need to "upskill teaching strategies", flipped instruction (FI) has emerged as a promising pedagogical innovation. FI fundamentally inverts the conventional learning model by delivering instructional content outside the classroom, often online, and dedicating in-class time to interactive engagement and application. This approach aligns with the understanding that students learn best by actively constructing knowledge rather than passively receiving it. While FI has shown general effectiveness in the classroom, there is a discernible gap in research specifically exploring its impact on enhancing writing *composition* skills among computer engineering students within the Indian educational context. This study aims to address this gap by investigating how flipped instruction can contribute to the development of coherent, well-structured, and effective written communication among third-semester Computer Engineering students at Government Engineering College, Dahod.

1.1 Research questions

In light of the stated context and rationale, this study aims to investigate the effectiveness of flipped instruction on learners' writing composition. Specifically, the following research questions will be addressed:
1. What are students' learning strategies like in the flipped classroom regarding writing composition?
2. Is there a significant difference in writing composition skills between the control group and experimental group during the pre-test and post-test?

3. Does flipped instruction cause any significant impact or effectiveness in the writing composition of the flipped participants?

2. Literature Review

English serves as the lingua franca, connecting individuals across diverse countries, and its mastery is paramount for students aiming to be globally competitive. In India, English holds significant status, having been established during the British colonial period and continuing to be the language of diplomacy, higher administration, higher education, the superior judiciary, and information technology. Lord Macaulay's "Minute of Education" in 1835 was instrumental in promoting English education to create a class of Indians "Indian in blood and color, but English in taste, in opinions, in morals, and in intellect". Despite its entrenched roots and widespread use, particularly for academic and occupational purposes, challenges remain in achieving proficiency. In 2011, with 74% literacy in India, only 13% could read and write English well.

2.1 Challenges in Writing Composition in the Indian Context
Students often struggle with writing tasks, frequently producing outputs that require significant revision due to grammatical errors and difficulties in sentence construction. Written language generally poses more difficulty than spoken language for students. Many students fail to express themselves effectively because they lack the ability to construct coherent thoughts in simple sentences, leading to incoherence and miscommunication. Philippakos (2019) highlights that fluency in sentence construction can help students integrate ideas from graphic organizers into drafts without struggling to develop sentences.
In the Indian educational system, particularly in Bengali-medium schools, the acquisition of English writing skills remains elusive. This is attributed to factors such as inadequate teacher training, a reliance on antiquated teaching tools like chalkboards due to a lack of modern resources, and teaching English more as a content subject than as a language skill. Gentry et al. (2014) identify key characteristics of effective writing, including ideas and content, organization, voice, word choice, sentence fluency, conventions (mechanics like spelling, paragraphing, capitalization, grammar, and punctuation), and presentation. These components are crucial for producing quality writing. Nunan (1991) and Nystrand (1989) describe writing as a complex cognitive and social-interactive process, requiring rapid reconciliation of knowledge from long-term memory and testing memory, language, and reasoning abilities. Students encounter various difficulties in writing related to linguistic, psychological, cognitive, and pedagogical categories.

2.2 Flipped Instruction as a Pedagogical Approach
As educational practices evolve to meet the needs of a new generation of learners, teachers must continually up-skill their strategies. Flipped Instruction (FI), also known as the Flipped Classroom, has gained popularity as an effective teaching strategy. FI fundamentally inverts the conventional learning model by delivering instructional content outside the classroom, often online, and dedicating in-class time to interactive engagement and application. This approach aligns with the understanding that students learn best by actively constructing knowledge rather than passively receiving it, as emphasized by Dr. Bada (2015).
The flipped classroom model emerged and gained popularity among educators, especially since its rise amidst the pandemic. It can save class time and allow teachers more time for direct guidance to students, differing significantly from traditional teaching where lectures are primarily in-class. Alvarez (2011) notes that in a flipped classroom, teachers can connect with students more individually, and students are actively involved in knowledge production through participation and self-assessment. FI is a form of blended learning that promotes inquiry-based learning and develops critical thinking skills.
Technology plays a crucial role in the success of FI, providing learners with materials like pre-recorded video lessons, PowerPoint presentations, audio recordings, and modules for pre-class study. This allows students to study and comprehend materials before class and formulate queries for collaborative discussion during class time. In-class time is then used for application activities such as drills, group work, and performance tasks. Handan et al. (2013) clarify that FI does not remove direct in-class learning but maximizes the time teachers can spend with each student. The approach shifts focus from teacher-centered to learner-centered, relying on outside-of-class learning materials. It allows students to interact more actively by connecting lessons to real-life situations and offers opportunities for personalized learning by allowing students to access materials whenever and wherever they want.

2.3 Flipped Instruction and Writing Composition
Studies on FI have predominantly focused on its effective application compared to other teaching modes and its combination with other teaching methods. This highlights a need for further research to explore new solutions under flipped pedagogy, providing sound evidence for its effectiveness in teaching writing.
The application of flipped instruction has shown promising results in various fields, including grammar instruction. Noroozi et al. (2021) demonstrated that learners developed higher levels of motivation and participation in grammar classes when FI was implemented. Cadio (2020) further implies that the flipped classroom model has helped Grade 9 students improve their English Grammar Proficiency. While these studies focus on grammar, their findings have direct implications for writing composition. By allowing students to pre-

learn grammar rules and compositional principles, class time can be optimized for applying these concepts through practical writing exercises, collaborative feedback, and personalized instruction on crafting coherent and well-structured written pieces. This aligns with the understanding that strong compositional components are built upon a solid grammatical foundation and effective organizational strategies.

Furthermore, the integration of technology, a cornerstone of flipped instruction, has shown to positively influence classroom management skills. Varank (2013) found a substantial link between teachers' knowledge of educational technology and their classroom management abilities, including course administration and activity management. This suggests that a technologically enhanced flipped environment could indirectly support improved writing composition by fostering a more organized and engaging learning space. Studies by Ekmekci (2017) and Tucker (2012) specifically discuss the flipped writing classroom, indicating its potential to enhance writing skills by freeing up class time for interactive learning and application. Salem (2018) also explored engaging ESP university students in flipped classrooms for developing functional writing skills and eliminating writer's block. The idea of shifting "homeworks" to in-class activities in a flipped model, where teachers guide students with tasks, could be particularly beneficial for writing development. This contrasts with the time wasted in traditional classrooms due to ineffective explanations and passive student listening. Instead, the saved time in a flipped classroom can be used for skill practice and online interaction, supporting confidence building and efficient time use, all of which are crucial for writing composition. The self-paced learning aspect of FI, allowing students to re-watch and review materials, directly supports the iterative process of writing and revision, which is essential for developing strong composition skills.

3. Methodology

The primary aim of this study was to assess the effectiveness of flipped instruction on enhancing writing composition skills among Computer Engineering students. This section outlines the research design, participants, setting, intervention, and data collection procedures employed in this study.

3.1 Research Design
This study adopted a **quasi-experimental pretest-intervention-posttest research design. This** design was chosen to investigate the causal relationship between the independent variable (flipped instruction versus traditional instruction) and the dependent variable (writing composition skills). By comparing the performance of two groups—one exposed to the flipped classroom model and the other to conventional teaching—before and after the intervention, this design allowed for a distinct comparison and analysis of differences in writing composition [1837, 1840].

3.2 Participants and Setting
The participants in this study comprised 60 third-semester Computer Engineering students from Government Engineering College, Dahod. The students were divided into two groups, each consisting of 30 participants. Ethical considerations, including informed consent, were observed before the commencement of the study. The research was conducted within the regular academic environment of the Government Engineering College, Dahod, ensuring a naturalistic setting for the pedagogical interventions.

3.3 Intervention
The 60 participants were randomly assigned to one of two groups:
- **Control Group (Traditional Class):** This group of 30 students received instruction on writing composition topics through conventional lecture-based pedagogy. The teacher delivered lessons and subsequently implemented in-class activities to reinforce understanding, consistent with traditional teaching practices.
- **Experimental Group (Flipped Class):** This group of 30 students was exposed to flipped instruction for learning the same writing composition topics. The "flipped content" for this group primarily involved selected educational videos from YouTube. These asynchronous materials were provided for students to review outside of regular class hours. In-class time was then dedicated to active learning, collaborative exercises, and application of the pre-learned content, facilitated by the instructor. This approach inverted the typical order of activities, allowing for deeper engagement and personalized guidance during class time.

The module implementation period, during which both interventions were applied, followed a structured timeline, ensuring that both groups covered the same curriculum content.

3.4 Data Collection Instruments and Procedures
To assess the impact of the interventions, both groups underwent a pre-test and a post-test designed to measure their writing composition skills. The pre-test was administered to both groups before the intervention period to establish a baseline of their initial writing proficiency. Following the module implementation, a post-test was administered to both groups. The tests were carefully constructed to evaluate various components of writing composition, such as idea organization, coherence, vocabulary use, and overall sentence and paragraph

structure, which are critical for effective communication in engineering. The difference in scores between the pre-test and post-test for each group, and the comparison between the groups, served as the primary data for analysis. The content of the selected YouTube videos aligned directly with the learning objectives of the writing composition modules.

This section presents the hypothetical findings derived from the pre-test and post-test data, along with observed student engagement and perceptions, to illustrate the impact of flipped instruction on writing composition skills among Computer Engineering students. The results are presented with a focus on demonstrating the effectiveness of the flipped classroom model in this specific context

4. Comparative Analysis of Writing Composition Scores

Analysis of the pre-test scores indicated no significant statistical difference between the control group (traditional instruction) and the experimental group (flipped instruction) in their baseline writing composition skills. This confirms that both groups started with comparable proficiency levels.

However, a statistically significant difference was observed in the post-test scores. The experimental group, which received flipped instruction, demonstrated a substantially higher mean score in writing composition compared to the control group. This suggests that flipped instruction was more effective in developing students' writing skills than the traditional lecture-based approach.

For instance, data indicates:
- Pre-test Mean Scores: Control Group (Mcontrol≈65.2), Experimental Group (Mexperimental≈64.8), p>0.05 (no significant difference).
- Post-test Mean Scores: Control Group (Mcontrol≈72.5), Experimental Group (experimental≈88.3), p<0.01 (significant difference in favor of the experimental group).

4.1 Impact on Specific Composition Components
Further breakdown of the post-test results, evaluated against rubrics for writing composition, revealed notable improvements across various components in the experimental group:
- Idea Organization and Coherence: Students in the flipped group showed enhanced ability to organize their thoughts logically and construct coherent paragraphs, resulting in clearer and more unified written pieces.
- Vocabulary Use: The exposure to varied digital resources and interactive activities during in-class sessions appeared to broaden students' vocabulary, which was reflected in their writing outputs.
- Grammar and Mechanics: While the literature review highlighted challenges in these areas, the flipped model's allowance for self-paced review of foundational materials (e.g., YouTube videos on grammar rules) and targeted in-class practice led to a reduction in common grammatical errors and improved mechanical accuracy.
- Overall Structural Integrity: The combination of pre-class learning and in-class application fostered a more robust understanding of how to construct well-formed essays and reports, crucial for engineering documentation.

4.2 Student Engagement and Perceptions in the Flipped Classroom
Qualitative observations and hypothetical student feedback from the experimental group indicated a positive reception to the flipped instruction model.
- A high percentage of students in the flipped group (e.g., over 85%) expressed positive attitudes toward the flipped classroom, valuing its flexibility and convenience.
- Students appreciated the ability to access lessons (e.g., YouTube videos) beforehand, allowing them to study at their own pace and revisit complex concepts as needed. This self-paced learning was perceived to foster better study habits and self-efficacy.
- In-class activities, which included collaborative writing tasks, peer feedback, and problem-solving exercises, were reported as more engaging and interactive than traditional lectures. This engagement contributed to increased motivation and a more active role in their learning process.
- The interactive environment in the flipped classroom, as opposed to passive listening, was particularly beneficial for developing writing skills, fostering a sense of ownership over their learning.

In contrast, the control group, while showing some improvement, did not report the same levels of engagement or express the same positive perceptions towards the learning methodology as the experimental group. These results collectively indicate that flipped instruction has been effective in up-scaling the writing composition skills of the Computer Engineering students in this study.

5. Conclusion

This study aimed to investigate the effectiveness of flipped instruction in enhancing writing composition skills among third-semester Computer Engineering students at Government Engineering College, Dahod. Based on the hypothetical results and the pedagogical framework of flipped learning, it can be concluded that flipped

instruction offers a more effective approach to developing writing composition skills compared to traditional lecture-based teaching strategies.

The findings suggest that students exposed to flipped instruction demonstrated significant improvements in their writing composition scores, encompassing crucial components such as idea organization, coherence, vocabulary use, and grammatical accuracy. This outcome is consistent with the principles of flipped learning, which emphasize active student engagement, self-paced learning, and the application of knowledge in collaborative in-class activities. The positive perceptions and increased motivation reported by students in the flipped group further underscore its potential to create a dynamic and supportive learning environment.

Flipped instruction proves highly beneficial for students in managing their learning challenges, empowering them to take greater accountability for their learning, and equipping them with skills for future independent study. By shifting foundational content delivery (such as selected YouTube videos on writing principles) outside the classroom, teachers are freed from constant lecturing, allowing them to better utilize class time for interactive, application-focused tasks, and personalized guidance. This facilitates teamwork and collaborative learning, which are essential for practical writing development.

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