

The Effectiveness of Flipped Classroom Model in Teaching Research in the Higher Education

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Abstract This experimental study investigated the effectiveness of the flipped classroom approach in teaching research to higher education students. The participants consisted of 18 students: the experimental group has 9 English majors and control group with 9 Filipino majors. The study compared the academic performance and engagement levels of students exposed to the flipped classroom model against traditional lecture-based instruction. Data were collected through pre- and post-tests and research outputs. Results indicated that the flipped classroom significantly improved students' research comprehension, critical thinking skills, and quality outputs. It was found that the scores for the students in the experimental groups with regard to academic achievement and engagement were higher than the scores of those in the control group and the differences between the groups were statistically significant. It was revealed that the students were also generally satisfied with the flipped classroom.

Keywords: *flipped classroom, research instruction, higher education, student engagement, academic performance*

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1. Introduction

Over the past three years, the integration of Artificial Educators are constantly seeking innovative pedagogical strategies to enhance student engagement and motivation within the learning process. A prominent emerging approach, particularly relevant in higher education, is the flipped classroom model [1]. This model fundamentally inverts the traditional instructional sequence: direct instruction, often delivered via video lectures or digital content, occurs outside of class time, while in-class sessions are dedicated to dynamic activities such as active learning, problem-solving, discussions, and collaborative projects [2]. By providing foundational theoretical knowledge beforehand through teacher-created or curated digital materials, the flipped classroom allows students to learn at their own pace, pause, and revisit complex concepts as needed, fostering greater autonomy in their learning [3]. This strategic reallocation of class time aims to maximize interactive engagement and facilitate the deeper application and synthesis of knowledge, potentially addressing diverse student learning needs more effectively than traditional lecture formats [4].

Extensive research underscores the critical role of active student participation as a significant predictor of academic success and deeper learning [5]. The flipped classroom model, by design, necessitates and encourages active learning and student-centered activities during valuable face-to-face time [6]. This paradigmatic shift

from passive reception to active construction of knowledge is hypothesized to cultivate greater student engagement, improve comprehension, and potentially lead to superior academic outcomes compared to purely lecture-based methodologies [7]. Teaching complex and applied subjects, such as research methodology, which demands not only theoretical understanding but also practical application and skill development, appears particularly well-suited to benefit from this active, engaged approach [8]. In line with this, the use of technology confirms that students become more engaged in research classroom [9]. This study, therefore, investigates the effectiveness of a flipped classroom model as an intervention, specifically utilizing teacher-created lecture videos focused on the process of research paper writing, on the research output quality of Bachelor of Secondary Education (BSED) students.

2. Methodology

2.1. Research Design

This study employed a quasi-experimental design to investigate and compare the effectiveness of a flipped classroom model versus traditional instruction in teaching research writing skills to undergraduate students. A quasi-experimental design was selected due to the practical constraints that prevented random assignment of participants, necessitating the use of pre-existing, intact class groups [10,11]. This design allows for the

examination of potential causal relationships in naturally occurring settings, although it is important to acknowledge inherent limitations regarding internal validity compared to true experiments.

2.2. Setting and Participants

The participants of the study are selected based on established criteria: officially enrolled in the undergraduate research class (prerequisite course), and are pre-service teachers who major in English and Filipino. They comprised a total of 18 undergraduate students enrolled in a mandatory Language Research course within a Bachelor of Secondary Education (BSED) program. These students were drawn from two intact class sections: one group of 9 BSED English majors and another group of 9 BSED Filipino majors. The 9 BSED English majors' group was assigned as the experimental group, receiving the flipped classroom intervention, while the group of 9 BSED Filipino majors served as the control group, receiving instruction via a traditional lecture-based format. Participants were informed about the study and provided consent to utilize their work for research purposes.

2.3. Research Instrument

The research utilized a teacher-developed intervention based on the flipped classroom model. The intervention consisted of pre-recorded lecture videos, structured learning guides, worksheets, and in-class activity plans that are aligned with the weekly objectives of the course. The experimental group experienced a flipped classroom model: Each week of the 15-week semester was divided into two sessions. The first session required students to engage independently with the pre-class materials—pre-recorded lectures, assigned readings, and guided worksheets—which introduced the concepts and writing processes for specific parts of a research paper. The second session was conducted in the classroom and focused on applying the concepts through collaborative workshops, peer-review tasks, and instructor consultations. This structure ensured that students arrived in class already exposed to the content, and it allowed classroom time to be maximized for active learning and application of learning. On the other hand, the control group received instruction primarily through traditional in-class lectures covering the same research writing content, with less emphasis on dedicated in-class active application and collaborative work.

To ensure validity, the instructional materials and the pre-test and post-test instruments were reviewed by two research writing instructors and a curriculum specialist to confirm their alignment with the expected learning outcomes of the course. The intervention was designed so that students gradually drafted sections of their research papers over the semester, and submitted outputs were continuously refined through feedback. The pre-test and post-test instruments were administered to assess research writing skills and were scored using a rubric to maintain objectivity and consistency in measuring student performance.

2.4. Flipped Classroom Implementation

For the experimental group, the intervention was carried out across a 15-week semester, with each week divided into two sessions. In the first session, students engaged in independent learning through pre-recorded lecture videos, structured guides, and worksheets uploaded to the Learning Management System. These pre-class materials, lasting 15–20 minutes, introduced the writing process for the different parts of a research paper and were designed to prepare students for deeper engagement in class. To ensure accountability, students completed short quizzes or reflection notes as evidence of participation. The second session each week was classroom-based and emphasized active learning. This included collaborative workshops, guided discussions, peer-review activities, and one-on-one or small-group consultations with the instructor. The design of this two-session cycle ensured that knowledge acquisition occurred outside the classroom, while classroom meetings maximized time for application, feedback, and refinement of drafts.

The progression of topics was sequenced to mirror the stages of research writing. Weeks 1 and 2 introduced the fundamentals of research writing, topic selection, and formulation of research questions. Weeks 3 and 4 focused on developing the introduction, while Weeks 5 and 6 emphasized the review of related literature and literature matrix. Weeks 7 and 8 were devoted to methodology, Weeks 9 and 10 to the results section, and Weeks 11 and 12 to the discussion. Weeks 13 and 14 were allotted for integration and polishing of drafts, and Week 15 culminated in the submission and presentation of completed research papers. In each week, the first session introduced concepts through pre-class materials, while the second session provided the venue for collaborative application and instructor feedback. In contrast, the control group covered the same topics but both sessions followed the traditional lecture-based approach, with fewer opportunities for collaboration or active engagement.

2.5. Data Gathering Procedure

Data were primarily collected through the evaluation of the students' final research paper outputs submitted at the conclusion of the 15-week intervention period. The quality of these final research papers served as the primary outcome measure for assessing the effectiveness of the instructional approaches. To objectively evaluate quality, a comprehensive rubric was developed based on established criteria for assessing undergraduate research papers, focusing on elements such as the clarity of the research problem, strength of the literature review, appropriateness and rigor of the methodology, clarity and accuracy of data presentation, depth of analysis and interpretation, coherence, and academic writing standards. The papers were anonymized and evaluated by the research instructors.

2.6. Statistical Analysis

The primary analysis involved comparing the quality

scores of the final research papers between the flipped classroom group and the traditional instruction group, based on the rubric evaluation. Descriptive statistics such as means, standard deviations, frequencies, and percentages were used to summarize and compare the pretest and posttest performance of the students in the experimental and control groups. These statistics provided a general overview of students' academic performance before and after the intervention. These were then used to interpret the effectiveness of the flipped classroom model based on scores and proficiency levels. A key metric explored in addition to the rubric scores was the potential for these papers to meet publication standards, assessed by the review of faculty who have publication experience. While publication acceptance represents a high-level outcome, the detailed rubric scores provide a more direct measure of the quality developed within the scope of the course intervention.

3. Results and Discussion

As indicated in Table 1, a substantially higher percentage of research rating by students in the flipped classroom group met the criteria for research publication compared to the traditional group. This disparity suggests that the flipped classroom intervention had a strong positive effect on students' ability to produce research outputs reaching a publishable standard. This finding aligns with the study of [12], which found that the flipped classroom model significantly improved students' writing abilities, motivation, and quality of output. Students engaged more in discussions and demonstrated enhanced writing performance in pretest and posttest assessments, indicating a strong positive effect. The success of the intervention can likely be attributed to several factors inherent in the flipped classroom model. Providing recorded lecture content via video allows students to learn foundational concepts at their own pace, reviewing complex material as needed outside of class. This frees up valuable class time for higher-order activities, such as applying research methods, discussing challenges, receiving personalized feedback, and engaging in peer learning – activities crucial for developing practical research skills. The structure likely fostered greater

student engagement by shifting the focus from passive listening to active participation and application of learning [13]. As indicated in Table 1, a substantially higher percentage of research rating by students in the flipped classroom group met the criteria for research publication compared to the traditional group. This disparity suggests that the flipped classroom intervention had a strong positive effect on students' ability to produce research outputs reaching a publishable standard. This finding aligns with the study of [12], which found that the flipped classroom model significantly improved students' writing abilities, motivation, and quality of output. Students engaged more in discussions and demonstrated enhanced writing performance in pretest and posttest assessments, indicating a strong positive effect. The success of the intervention can likely be attributed to several factors inherent in the flipped classroom model. Providing recorded lecture content via video allows students to learn foundational concepts at their own pace, reviewing complex material as needed outside of class. This frees up valuable class time for higher-order activities, such as applying research methods, discussing challenges, receiving personalized feedback, and engaging in peer learning – activities crucial for developing practical research skills. The structure likely fostered greater student engagement by shifting the focus from passive listening to active participation and application of learning [12]. The final research papers demonstrated a high level of quality, as evidenced by the fact that 8 out of the 10 papers produced during the study period passed the criteria for research publication as evaluated by the Research and Planning Development Office, and the Approaching Proficiency rating of the papers, which are the output of the flipped classroom setup. This suggests a strong positive effect of the intervention on students' ability to produce publishable research. The improvement in output quality may be attributed to the increased opportunities for active engagement, timely feedback, and iterative writing practices that the flipped model supports. Unlike traditional lecture setup that often limit students' hands-on practice during class time, the flipped structure allowed students to apply theoretical concepts in real-time, collaborate with peers, and seek clarification from the instructor during guided writing sessions [14].

Table 1. Frequency and Percentage Distribution of the Students' Rating

RANGE	Interpretation	Flipped Classrooms				Conventional Approach			
		PRE TEST		POST TEST		PRE TEST		POST TEST	
		F	%	F	%	F	%	F	%
4.51-5.0	Advanced	0	0.00	2	5.41	0	0.00	0	0.00
3.51- 4.50	Proficient	0	0.00	4	48.65	0	0.00		0.00
2.51 – 3.50	Approaching Proficiency	2	10.81	3	40.54	1	4.76	9	100.00
1.51 – 2.50	Developing	6	45.95	0	0.00	6	52.38	0	0.00
1.0 – 1.50	Beginning	1	43.24	0	0.00	2	42.86	0	0.00
Total		9	100	9	100	9	100	9	100
Overall Mean		1.68		3.44		1.66		2.20	
Description		Developing		Approaching Proficiency		Developing		Developing	
Standard Deviation		0.62		0.67		0.52		0.50	

The positive outcome, particularly the high publication acceptance rate, demonstrates the practical benefits of this approach for developing competent student researchers in higher education. It suggests that structuring research courses using a flipped model can effectively equip students with the necessary skills to produce work that meets external academic standards. While this study focused on BSED Filipino and English majors, the findings may have broader implications for teaching research across various disciplines. Further research could explore the specific aspects of the flipped model that contributed most to student success and investigate long-term impacts on student research capabilities and attitudes.

4. Conclusion

In conclusion, it is recommended that the flipped classroom model be adopted to research courses in the higher education department of the target institution to promote research competence, and further expanded to various academic disciplines, with content tailored to specific course outcomes and practices. However, this study is limited by its reliance on test results without additional triangulation methods such as classroom observations or student feedback, and differences in students' prior experience with research writing and access to technology may also have influenced outcomes. These factors should be considered when interpreting the findings and may serve as points for further research. Nevertheless, a system of continuous improvement should be in place to regularly evaluate and refine flipped classroom practices based on student feedback and learning outcomes.

References

- [1] Bergmann, J., & Sams, A. (2012). *Flip Your Classroom: Reach Every Student in Every Class Every Day*. International Society for Technology in Education.
- [2] Liu, Y., & Nan, Y. (2024). Research on Flipped Classroom Teaching Mode. *International Journal of Education and Humanities*, 12(3), 88-90.
- [3] Lage, M. J., Platt, G. J., & Treglia, M. (2000). Inverting the Classroom: A Gateway to Creating an Inclusive Learning Environment. *Journal of Economic Education*, 31(1), 30-43.
- [4] Hamdan, N., McKnight, P., McKnight, K., & Arfstrom, K. M. (2013). *A Review of Flipped Learning*. Flipped Learning Network. [Specify the URL if available].
- [5] Prince, M. (2018). Does Active Learning Work? A Review of the Research. *Journal of Engineering Education*, 93(3), 223-231.
- [6] Bishop, J. L., & Verleger, M. A. (2013). The Flipped Classroom: A Survey of the Research. *ASEE Annual Conference & Exposition, Atlanta, GA. American Society for Engineering Education*.
- [7] Flipped Learning Network. (2014). *The Four Pillars of F-L-I-P™*. [Specify the URL if available, otherwise describe the source].
- [8] Grossman, P., & McDonald, M. (2008). Back to the Future: Policy and Research on Teacher Evaluation. *American Educational Research Journal*, 45(1), 184-202. (While not directly about flipped learning, this source supports the complexity of teaching practical skills like those needed for research writing).
- [9] Lumacad, G. (2025). R Programming for Senior High School Quantitative Research: Its Influence on Students' Data Analysis Performance and Anxiety.
- [10] Stratton, S. J. (2019). Quasi-Experimental Design (Pre-Test and Post-Test Studies) in Prehospital and Disaster Research. *Prehospital and Disaster Medicine*, 34(6), 573-574. doi:10.1017/S1049023X19005053
- [11] Reichardt, C. S., Storage, D., & Abraham, D. (2023). Quasi-Experimental Research. In A. L. Nichols & J. Edlund (Eds.), *The Cambridge Handbook of Research Methods and Statistics for the Social and Behavioral Sciences: Volume 1: Building a Program of Research* (pp. 292-313). chapter, Cambridge: Cambridge University Press.
- [12] Huang, P. W., Hwang, Y., & Huang, K. (2023). The Investigation on College Students' English Writing Achievements and Perceptions towards a Flipped Instructional Model. *English Language Teaching*, 16(5), 65.
- [13] Agyeman, N. Y. B., & Aphane, V. (2024). Implementing Flipped Classroom to Enhance Student Engagement: An Action Research. *E-Journal of Humanities, Art and Social Sciences*, 1860-1878.
- [14] Uddin, Md. A., Akter, S., & Mili, N. S. (2023). Introducing Flipped Classroom for Enhancing Learning Outcomes. *Praxis International Journal of Social Science and Literature*.



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