Conference Name: EduCon Tokyo – International Conference on Education, 20-21 January 2025
Conference Dates: 20-Jan- 2025 to 21-Jan- 2025
Conference Venue: TKP Ichigaya Conference Center, Building 2F, 8 Ichigaya Hachiman-cho, Shinjuku-ku, Tokyo 162-0844
Appears in: PUPIL: International Journal of Teaching, Education and Learning (ISSN 2457-0648)
Publication year: 2025

Shun Ling Chiang, 2025
Volume 2025, pp. 09-10
DOI- https://doi.org/10.20319/ictel.2025.0910
This paper can be cited as: Chiang S.L.(2025). Investigating The Effectiveness Of Various Modes Within Flipped Classroom Instructions In Mathematics In Higher Education. EduCon Tokyo – International Conference on Education, 20-21 January 2025. Proceedings of Teaching and Education Research Association (TERA), 2025, 09-10

INVESTIGATING THE EFFECTIVENESS OF VARIOUS MODES WITHIN FLIPPED CLASSROOM INSTRUCTIONS IN MATHEMATICS IN HIGHER EDUCATION

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Abstract

This study investigated the effectiveness of various modes within flipped classroom instructions on students' academic performance in mathematics courses in higher education. The study explored various factors when implementing the flipped classroom model, including delivery modes, revision sessions, proportions of problem-solving and discussion classes, types of discussions, course levels, target student groups, and core versus elective courses. A quasi-experimental design was employed to compare exam results and final letter grades of students in mathematics courses taught by the same instructor using different flipped classroom modes. The sample consisted of 1107 students across seven selected courses from 2020 to 2023. The sample provided a comprehensive analysis of student outcomes in diverse contexts. The findings highlighted the positive impact of dual-mode classes and the importance of balancing revision sessions. Additionally, a balanced mix of problem-solving and discussion activities, student-initiated discussions, and tailored instruction for different course levels and target student groups were found to enhance student performance. The study provides valuable insights for educators and curriculum

designers on the implementation of the flipped classroom instructions in mathematics higher education. The findings support that educators can optimize the effectiveness of the flipped classroom instruction and enhance student performance in mathematics education in certain ways. Those include incorporating dual-mode classes, minimizing reliance on revision sessions, striking a balance between problem-solving and discussion activities, promoting student-initiated discussions, tailoring instruction to different course levels and target student groups, and offering elective options. These findings contribute to the ongoing exploration of innovative teaching methodologies, ultimately improving educational practices and fostering student success in mathematics in higher education.

Keywords:

Flipped Classroom**,** Mathematics Education**,** Higher Education**,** Teaching Methods, Quasi-Experimental Design