EFFECTIVE INSTRUCTIONAL STRATEGIES IN SENIOR HIGH SCHOOL MATHEMATICS: ENHANCING STUDENT ACHIEVEMENT THROUGH STUDENT-CENTERED AND INTEGRATIVE APPROACHES

by:
Rochelle B. Almodal
St. Francis National High School

In Senior High School mathematics, employing diverse instructional strategies has been shown to enhance student learning and academic achievement. For example, a quasi-experimental study found that applying multiple teaching methods, including game-based, outcome-based, technology-based, and traditional approaches, influenced senior high school students' mathematics performance, with outcome-based strategies producing notable gains in mastery of concepts compared to other methods. Although all groups showed improvement, the study highlighted that variations in instructional strategy can differentially impact student outcomes in mathematics classrooms, underscoring the need for teachers to thoughtfully select and integrate strategies that align with students' learning needs (Libo-On & Perez, 2022)

Beyond comparative strategy studies, research indicates that integrated and student-centered designs rooted in educational philosophies like STEM can further enrich mathematics learning. A study exploring instructional design based on the STEM education philosophy argued that creating authentic situations, facilitating collaborative inquiry, and incorporating technology can deepen students' conceptual understanding and problem-solving skills. This approach emphasizes engaging learners through real-world contexts and differentiated tasks, which supports a more meaningful and comprehensive grasp of mathematical content compared to rote memorization or lecture-focused delivery. Such integrative strategies acknowledge the complexity of mathematics learning and cater to diverse learner profiles (Li et al., 2020).

Effective mathematics instruction also entails understanding how everyday classroom practices influence students' engagement. A study on common teaching strategies among high school mathematics teachers reported that the use of varied pedagogical approaches — such as interactive instruction, collaborative tasks, and differentiated activities — contributed to differences in students' learning achievements. The results showed that exposure to diverse teaching strategies was linked to improved academic performance, implying that teacher adaptability and responsiveness are key to fostering student success in mathematics. This aligns with broader literature advocating for instructional flexibility and strategic planning in mathematics education.

Finally, various study shown the importance of contextual factors in selecting effective teaching strategies. Research on instructional media in senior high school mathematics suggests that appropriate use of media and materials can significantly affect students' understanding and achievement. While this study focused on the medium rather than strategy per se, it highlights that strategy effectiveness is often intertwined with other classroom elements, including learning resources and technological support. Together, these insights reinforce that high-quality mathematics instruction in senior high school is not stagnat but rather a blend of purposeful strategy selection, resource utilization, and learner-centered design

References:

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