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The promise of differentiated instruction for enhancing the mathematical understandings of college students.

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Summary: Mathematics instructors must respond to diverse needs of individual students, including different abilities, interests, learning styles and cultural backgrounds. To do so, grade kindergarten-12 teachers have been using differentiated instruction, a process of proactively modifying instruction based on students' needs. It is supported by literature on learning and has resulted in the improvement of grade K-12 students' learning. Yet, there is no research literature that reports work on differentiated instruction at the undergraduate level for meeting the diverse needs of college students, particularly in mathematics courses. Students frequently report their college mathematics classes to be unstimulating, boring, irrelevant, poorly taught or transmissive. This study examined the use of differentiated instruction in an undergraduate mathematics course for addressing such concerns and thereby improving students' mathematical learning. A concurrent mixed methods research study was used to address the central research question: What impact does differentiated instruction in a college mathematics class have on students' mathematical understandings? A quasi-experimental pre-test and post-test control-group research design measured the relationship between the differentiated instruction in the course and the students' mathematical understandings. Simultaneously, the impact of the differentiated instruction on the students' mathematical understandings was explored using interviews and analyses of students' work. The participants included elementary education majors enrolled in a mathematics course covering the topic of number and operations. Results showed that students receiving differentiated instruction experienced greater gains in their mathematical understandings. Suggestions for incorporating differentiated instruction in undergraduate mathematics courses are provided along with plans for further research.

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