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Effectiveness of different tutorial recitation teaching methods and its implications for TA training¹

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We present results from a comparative study of student understanding for students who attended recitation classes that used different teaching methods. The purpose of the study was to evaluate which teaching methods would be the most effective for recitation classes associated with large lectures in introductory physics courses. Student volunteers from our introductory calculus-based physics course at the University of Cincinnati attended a special recitation class that was taught using one of four different teaching methods. A total of 272 students were divided into approximately equal groups for each method. Students in each class were taught the same topic, “Changes in Energy and Momentum,” from “Tutorials in Introductory Physics” by Lillian McDermott, Peter Shaffer and the Physics Education Group at the University of Washington. The different teaching methods varied in the amount of student and teacher engagement. Student understanding was evaluated through pretests and posttests. Our results demonstrate the importance of the instructor’s role in teaching recitation classes. The most effective teaching method was for students working in cooperative learning groups with the instructors questioning the groups using Socratic dialogue. In addition, we investigated student preferences of modes of instruction through an open-ended survey. Our results provide guidance and evidence for the teaching methods which should be emphasized in training course instructors.

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