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Clicker use in introductory biology: Impacts on exam performance

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Abstract for DBER Group Discussion on 2016-10-13

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Title

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Abstract

In-class response systems, or clickers, are useful formative assessment tools that support learning by providing real-time feedback that can be used to correct misconceptions through peer discussion and instructor guidance. Previous research has shown that peer discussion improves conceptual understanding within a class period. In this study, we asked whether the benefits of peer discussion could be detected on a longer time scale. We asked exam questions that were isomorphic to in-class clicker questions and found students that participated in peer discussion scored higher than students that were not in class for the discussion. We also examined the effect of clicker question format. Clicker questions are typically asked in a multiple-choice (MC) format in which students identify one preferred answer; however, this format cannot identify students with mixed conceptions, where they simultaneously hold correct and incorrect ideas. Conversely, multiple-true-false (MTF) questions challenge students to separately evaluate each answer option, and thus have the potential to identify and correct mixed conceptions. We found no effect of clicker question format related to performance on isomorphic exam questions. Overall, clickers have a positive effect on student performance. And while MTF questions do not have additional benefits relative to MC questions, they are an effective formative assessment tool for identifying mixed conceptions among students and offer instructors an alternative method for implementing clicker pedagogy.