macmillan learning

Educator Study with iClicker 2018-01

BOISE STATE UNIVERSITY

COURSE:	Physics II with Calculus, delivered face-to-face to 104 students
PRODUCT USED:	iClicker Cloud
STUDY DESIGN:	Mixed methods with descriptive and correlational analyses

How iClicker Cloud supports student academic performance in a large Physics II classroom

Institutional and Course Context

Boise State University is a public university offering bachelor's and graduate degrees. The institution serves over 22,000 students. This Physics II with Calculus course was taught face-to-face to 65 students. Students met three times a week and were expected to keep up with their reading and assignments throughout the week. The instructor has been teaching for 30 years and has been teaching in this specific department for four years. The instructor has used digital learning tools in the past and has wanted to promote student participation with a real-time feedback system.

Instructor Implementation

The instructor used iClicker Cloud to track student participation. Students were required to answer at least 50% of the iClicker questions during each class to receive participation credit for that class. They received participation credit regardless of whether they answered the question correctly. Participation credit accounted for 20% of the students' overall course grade. The instructor presented iClicker questions in 89% (39 out of 44) of the classes, with a total of 220 questions asked over the course of the semester. Eighty-three percent of the questions were multiple-choice, and 17% were numerical items.

Course Goals and Challenges

Boise State University chose iClicker Cloud as their institution-wide student response system, and they provided support for the instructors and students who used iClicker Cloud. This particular instructor used iClicker to increase student interaction. The instructor believed that students who use iClicker pay more attention in class because they know questions will be presented to them throughout the lecture. Since the instructor weighted iClicker responses to account for 20% of the students' overall course grade, students understood the importance of participating during lectures and how the learning tool could affect their own learning.

> ***"The students like iClicker Cloud. It makes class not as boring from their point of view. It's more interactive."***
> —Instructor

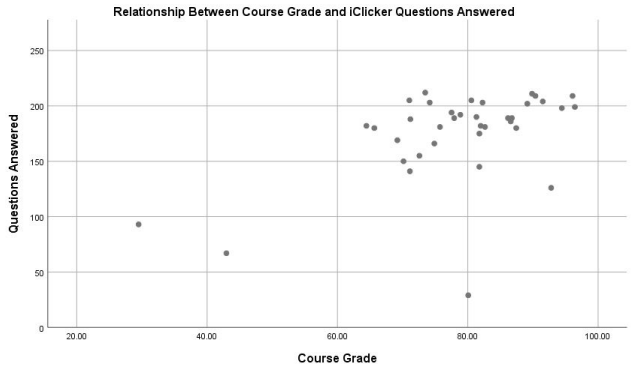
Study Design

The study examined whether use of iClicker Cloud was related to student outcomes, including learning, course completion, engagement, and satisfaction. In addition, information about instructor and student perceptions of iClicker Cloud was gathered. iClicker usage was documented through platform data along with midsemester observations of classroom implementation and instructor interviews. Student learning data were collected at the end of the semester via course records shared by the instructor. End-of-semester surveys were used to gather data on instructor and student perceptions of

the product along with student engagement. Data were matched across sources, and descriptive and correlational analyses were conducted.

Results

Use of iClicker Cloud supported student academic performance. There was a significant positive relationship (.433) between the amount of iClicker questions students answered and their performance in the course. Students who answered more iClicker questions tended to have a higher overall course grade. Conversely, students who answered less questions tended to have lower course performance. There was also a significant positive relationship (.394) between the mean number of iClicker questions answered and student course performance.



Students enjoyed the course that implemented iClicker Cloud more than courses that did not use iClicker Cloud. Eighty percent of students reported that using iClicker made the class more enjoyable than classes that did not use iClicker. Students rated their overall engagement levels as higher than average (3.39 on a 5-point scale). Students reported that use of iClicker helped keep their attention focused on lectures, that some questions allowed them to interact with the instructor and/or their classmates, and that they enjoyed being able to see if their iClicker responses were correct. The instructor also strongly agreed that use of iClicker increased student engagement in the class.

iClicker Cloud helped students better understand concepts. Both the instructor and students (90%) felt that the immediate feedback iClicker provides helped students better understand concepts. Ninety percent of students said that iClicker made them more aware of misunderstandings they had about concepts discussed in class. The instructor and students indicated in an open-ended survey that one of the best aspects of iClicker Cloud for students was the immediate feedback they received.

The anonymity iClicker Cloud provides helped students feel more confident in class. Eighty percent of students enjoyed the anonymity iClicker provides. Sixty percent of students said they would be more likely to participate in a class that uses iClicker Cloud than a class that does not use iClicker. The instructor strongly agreed that iClicker increased the active participation of students in the class.

Both the instructor and students reported that iClicker Cloud was easy to use and that it increased their understanding of the subject matter. Seventy percent of students said that iClicker helped them better understand the subject matter than a traditional lecture format. The instructor reported that iClicker Cloud was easy to use and that the various features integrated well with the class—it was flexible enough to meet both the instructor's and the students' needs.

Insights for Optimization

The instructor has provided insightful feedback about several iClicker Cloud features. The instructor wants to be able to delete individual questions from a session without deleting the entire session. For example, if a question is coded as a numerical item, then the question can not be changed to multiple-choice without deleting the entire session. The instructor also wants to see a range of values accepted as a correct response for numerical items and the attendance feature to be integrated into the desktop application. This feedback has been shared with the iClicker Cloud product team for product optimization.

Insights for Instructors

One of the most critical findings from this educator study is the strong positive relationship between the amount of iClicker questions answered and student course performance. As students participate more in the lecture by answering the instructor's iClicker questions —regardless of whether their responses are correct—student course performance tends to increase. Another important finding is that students value the immediate feedback iClicker provides and its contribution to their learning. Therefore, instructors using iClicker Cloud should consider increasing the amount of iClicker questions that they ask over the course of a semester.

Note: These results are part of a larger iClicker Cloud implementation study across multiple institutions. To access the full report and results, please visit http://www.macmillanlearning.com/catalog/page/learningscience