



Instructor finds success increasing student engagement using iClicker in a small, Honors Logic course at Auburn University

Macmillan Learning partnered with an Honors Logic instructor at Auburn University to examine how using iClicker in their logic course is related to engagement and academic performance

About iClicker

iClicker is built on the science of active learning. A synthesis of educational research in the areas of effective active learning, formative assessment, and interactive learning guided the development of iClicker. With its simple, reliable technology and focus on pedagogical content, iClicker makes it possible for instructors to take attendance, engage students in all sized classrooms and lecture halls, and use the students' responses to decide which topics to emphasize.

iClicker is a flexible solution that can adapt to an instructor's pedagogical approach. A 2017 implementation study identified the "engagement model" as one of the most often implemented approaches. In this model instructors write their own iClicker questions, pose the question to the class and ask them to respond. Responses are used to gauge understanding and spark classroom discussion. Students receive credit for participating in the iClicker activity and in some cases the responses are marked as correct or incorrect. The goal of this model is to increase comprehension and understanding through engagement.

Institution and course context

Auburn University is a public research university offering bachelor's, master's, and doctoral degrees. The institution serves over 23,000 students with one main campus in Auburn, Alabama. This Honors Logic course was taught face-to-face to 24 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 six years and has been teaching in this specific department for all six of those years. The instructor has used digital learning tools in the past, including iClicker, and has been extremely comfortable implementing them.

Course challenges and goals

The instructor used iClicker to increase effort and engagement within the classroom. This instructor had been using iClicker for a few years. The instructor started out with iClicker remotes but transitioned to mobile devices. Students seemed to enjoy answering questions directly on their mobile device. This semester the instructor decided to give iClicker questions more weight in class (80% of the students' final grade is made up of iClicker questions). The instructor found that students enjoy this usage pattern and, in the past, has anecdotally observed that students using iClicker are engaged throughout the class.



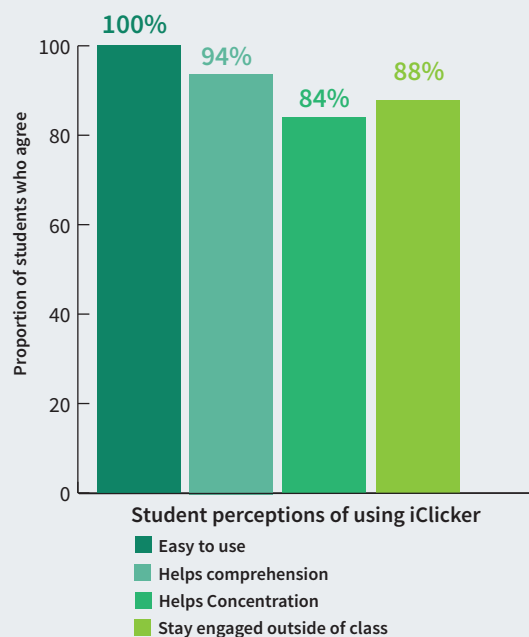
"Courses that don't use the iClicker are so boring and I zone out, with iClicker I stay interested in the entire class."

- Student

iClicker use case

Students received one point for responding to iClicker questions, and they earned a second point if they answered the questions correctly. iClicker questions accounted for 80% of the students' overall course grade. The instructor's goal was to engage students in class. The instructor presented iClicker questions in 79% (33 out of 42) of the classes, with a total of 232 questions asked over the course of the semester. Ninety-one percent of the questions were multiple-choice, 3% were numerical, and 5% were short answer.

Figure 1. Student perceptions of using iClicker



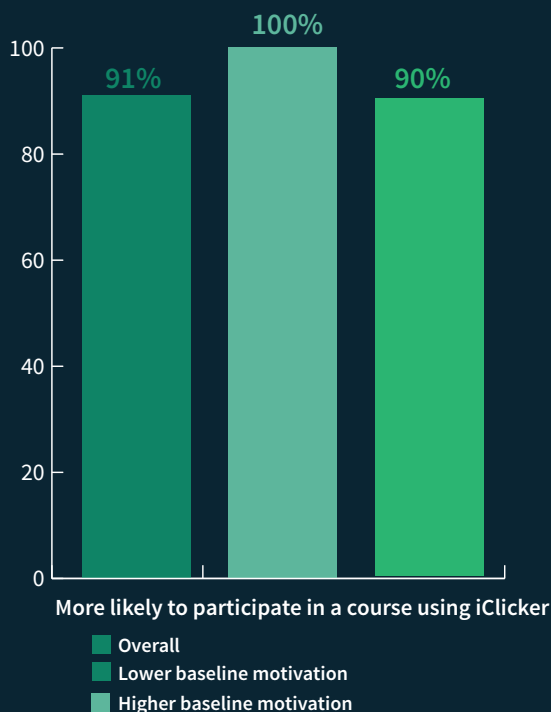
100% of students in the study reported that iClicker is easy to use, and 94% say that the immediate feedback they receive helps them better comprehend the courses material. 84% of students say that using iClicker helped them concentrate in class, and 88% say that iClicker helped them stay engaged even outside of class time.

iClicker Reef supports student participation in class, even for students with a lower baseline level of motivation.

Both the instructor and students reported that iClicker Reef increased student participation in class. Ninety-one percent of students said they were more likely to participate in a class that uses iClicker than a class where they must raise their hand to participate. Eighty percent of students said they enjoyed the anonymity iClicker provides. In addition to the students, the instructor felt that using iClicker increased student participation.

Analyses were conducted on the small subset of students who, based on their responses to a scale on the baseline survey were classified as having a low baseline level of motivation. All of the students in this subgroup (n=6) either agreed or strongly agreed that they are more likely to participate in a course that used iClicker than in a course where it wasn't used.

Figure 2. Student perceptions of class participation using iClicker



"Students aren't going to learn anything if they aren't engaged. The primary goal is engagement and the secondary goal is understanding. Students like the immediate feedback about whether they are grasping the material. They stay engaged and find out what they don't understand fast."

- Instructor

iClicker Reef supports student engagement.

One-hundred percent of students reported that they were more engaged in class material because they used iClicker Reef. Students rated their overall engagement levels as higher than average (4.55 on a 5-point scale).

Students were asked to share their favorite iClicker feature in an open-ended question, and several students said they enjoyed answering questions and participating in polls with iClicker. Students liked the fact they can use iClicker on their mobile devices. Students also reported that the use of iClicker helped them check their understanding of the material. Students reported that iClicker is a helpful interactive tool that facilitates classroom learning and is easy to use. The instructor reported that the primary goal for using iClicker was to engage students and the secondary goal was for them to better understand the material.

Insights for Optimization

The instructor has provided insightful feedback on several features to integrate into iClicker Reef. The instructor has suggested that it would benefit students and instructors if the mobile application had self-paced polling for the students. The results of this study have generated recommendations for the iClicker Reef product team. The instructor raves about iClicker to colleagues but feels that many of them are hesitant to bringing technology into the classroom. The instructor suggests to them that the simplicity of iClicker makes it a good introductory tool.

Insights for Instructors

One of the most critical findings from this educator study is the significant positive relationship between the number of iClicker questions answered and student course performance. As students participate more in the lecture by answering the instructor's iClicker questions, student course performance tends to increase. Students believe that use of iClicker increases their participation within the classroom as well as their concentration during lessons. Students also report that iClicker helps them better understand the material. Therefore, instructors in similar educational contexts might consider increasing the number of iClicker questions presented in class to increase overall student performance.

Study limitations

Although the data are rich and the findings important for product optimization and insights for instructors, they are specific to this course and cannot be generalized to all instructors who use iClicker. The results are also descriptive and correlational and should not be used to infer causation.

Ethics and Data Privacy

Prior to data collection, this study and the associated consent forms and instruments were reviewed and approved (found exempt) by the Human Resources Research Organization (HumRRO). HumRRO is an accredited third-party Institutional Review Board (IRB) organization with no affiliation with Macmillan Learning. Macmillan Learning also adheres to any local IRB requirements at participating instructor's institutions. The data in this study, which are provided by the instructor and consenting students, are initially identifiable. However, once a random identifier is generated identifiable data are destroyed. Data are provided in secure storage locations, and access is permitted only to the Primary Investigator in the study and the Co-Primary Investigator for quality assurance of match and analysis.



Amplifying the IMPACT

Research on iClicker suggests that trying these strategies may increase the positive impact of iClicker

1. Ask more in-class iClicker questions

this is related to higher final course grades

2. Mark responses as correct or incorrect and incorporate scores into student grades

this drives engagement

3. Share the distribution of results and discuss trends that stand out

this helps to fill skills gaps and correct any misconceptions

4. Explore peer-to-peer discussion of results

this drives engagement and comprehension

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