

INTERACTIVE LEARNING WITH CLICKERS: TEACHING USING AUDIENCE RESPONSE SYSTEMS IN A CREDIT-BEARING LIBRARY RESEARCH COURSE

DANIELLE A. BECKER

INTRODUCTION

Teaching using audience response systems has brought hands-on interactive learning into the library instruction classroom. Education research asserts that active participation in the classroom positively impacts student learning (Graham, 2007). If hand-raising is the only way students are allowed to respond in the classroom, the tentative students will be excluded from the learning process. The result for these students is a passive learning experience rather than an active one. Net Generation students are accustomed to multimedia formats and, as a result, they respond best to class periods that are both diverse in structure and in content (Windham, 2005). To ensure the possibility of success for *all* students—the assertive and tentative—library instruction should follow this approach and using audience response systems is an effective first-step.

Clickers are also known as audience response systems, personal response systems, student response systems or group response systems. In this article the term “clickers” is used to refer to the type of individual student response technology that enables students to interact with their instructors and classmates instantly. This is done through the use of wireless technology in the form of hand-held devices resembling television remote controls. The three most popular transmission formats for these devices are infrared (IF), radio frequency (RF) and Wi-Fi. Infrared uses the same technology as a television remote control or the Wii gaming system. The user needs to point the hand-held device in the direction of a receiver that will transmit the signal to the computer via a USB port. The RF format uses a radio frequency that is specific to

the device and is also picked up by a receiver that plugs into a computer’s USB port. Wi-Fi uses the same technology as the wireless internet and is utilized by either devices purchased specifically for this purpose (like the clicker devices made for the software) or dual-purpose devices (such as a Blackberry, iPhone, or iTouch) or personal computers.

Clicker technology may have advanced making these devices easier to use, more powerful and cost-effective, but the concept has been used in classrooms for about 40 years (Patry, 2009). Clickers were designed in the 1960s and used in Hollywood to test unreleased movies, commercials and television shows. A decade later they were developed for business and used in meetings and presentations, followed by their introduction into education (Bugeja, 2008).

In 2005, Hunter College purchased eInstruction clickers as a way to incorporate more technology in the classroom. Faculty in an array of disciplines (e.g., sciences, social sciences, education) used this system in a variety of ways. Some used it to take attendance, administer quizzes and tests and to gauge students’ backgrounds in topics under discussion. Other courses used them to deliver lectures on a one-shot basis as a way to engage students in discussions or to present materials in a game-like format. Until now, Podcasting, Smart Board and course management software like Blackboard were the only technologies used in library instruction at Hunter.

CHALLENGES

Learning curve

There can be a steep learning curve in adapting clicker technology. Depending on the system being used, and the instructor’s familiarity with different technologies, it can be a

Becker (Assistant Professor/Web Librarian)
Hunter College [New York, NY]

frustrating experience. When learning new software and hardware most people expect problem-free technology, so when unexpected problems arise both the instructor and the student may lose interest and become critical of the technology. If the instructor is left to learn clickers without support or useful training materials, the risk of giving in to the frustration and deciding against using clickers rises significantly. In many cases, one must be determined to use clickers to follow-through on the training.

Increased prep time

After learning the software and hardware, instructors must plan to invest a significant amount of time initially designing their clicker-based lesson. Although experience with Microsoft PowerPoint software (if the instructor is designing a lesson that interacts with PowerPoint) is helpful, designing a CPS-based PowerPoint lesson is more time-intensive because each question and its related answers must be configured into the presentation for the clickers to properly interact during the lesson. Therefore, care must be taken when entering the answers using the steps outlined by the software.

Increased class time

Integrating clickers into a class period requires time to set up and explain clicker use to the students. Although typical Net Gen students are eager to learn and experiment with new technologies, they won't necessarily learn the devices faster than an average user. They may be interested, but without previous experience, they will need to practice with the device before they understand how to use it to effectively register their answers during the lesson. They will also need time during the lesson to register their answers, and many learn by trial and error. Expect students to comment that the answer they attempted to enter didn't register and that they unintentionally entered an incorrect answer. These encounters will elongate class time.

Technical support

The inclusion of technical support in all stages of the implementation process is crucial to the success of using clickers in the classroom. If technical support isn't available to assist if any problems arise, the instructor must be experienced enough with the software to be able to trouble-shoot if issues arise during the lesson.

Response and confidence

There are several clicker devices and accompanying software packages currently available on the market. The device used in "The Seven Deadly Sins of Plagiarism" lesson was purchased in 2005 and as a result, there were several technological challenges. First, CPS, the software designed by eInstruction, was slow to interact with Microsoft PowerPoint and in many instances took several attempts to configure and launch. Second, when the presentation was underway, the devices were slow in registering student answers to the questions. For example, when a question was posed, the time lag between when the student entered their answer into the keypad of the device and when it was

reflected in the PowerPoint presentation was approximately fifteen seconds. Therefore, when the student expects instant feedback, they have to wait to see their answer appear on the grid of the presentation. Often, this resulted in student (or users, in the instance of the presentation given at LOEX 2010) to question if the device registered their answer. This was not such a distraction for students during the lecture because they were also in an active learning mode, so they were more talkative and discussed their answers as they went along.

However, during the presentation at LOEX 2010, participants were visibly distracted and disappointed by this processing time. It shook their confidence in using the clickers; wary of the effect this dead time would have on the students in the classroom. When asked, at the end of the presentation, if the participants thought using clickers for library instruction was a good idea, half of the participants answered no. During the question and answer portion of the presentation, the feedback was mixed: The participants who had previously used clickers commented that the systems they used were notably faster than those used in the demonstration and that they observed how "clunky" the eInstruction system was during the presentation. The other participants agreed that if the devices demonstrated were faster they would be more enthusiastic about the role that clickers could play in library instruction. It inhibited engagement by the participants, many grew frustrated and either did not register their answers on the keypads, or needed repeated encouragement by the presenter to participate in the demonstration.

LITERATURE REVIEW

Most research on the use of clickers deals with their use in the classroom, while little deals specifically with use in library instruction. Several studies have been conducted on the use of clickers in large college classes. One large study of 94 lecture sections with an average enrollment of 144 students, conducted at the University of Colorado at Boulder, assessed student attitudes and perceptions of the use of clickers. In their findings, Keller and Finkelstein (2007) concluded:

Students have a much more positive attitude towards the utility of clickers if faculty encourage discussion and are able to get a large fraction of students discussing. Likewise, student attitude is also improved when students are actively participating in discussions with their peers, as opposed to being passive or working independently (p. 131).

Another approach measured the experiences of implementing clickers in four University of Wisconsin campuses, UW-Milwaukee, UW-Eau Claire, UW-Oshkosh, and UW-Whitewater in the fall of 2005. They measured both faculty and student perceptions and attitudes regarding clickers using a five-point Likert scale (strongly disagree, disagree, neutral, agree, strongly agree). Kaleta and Joosten (2007) found that both faculty and students agreed that clickers helped stimulate class discussion and increased participation.

Some case studies have been conducted on the effec-

tiveness of audience response systems in library instruction. One such study (Dill, 2008) was conducted during fall semester 2006 at Indiana University-Purdue University Columbus that examined eight sections of a one credit hour course called University College U110, which covers time management, study skills and an introduction to the library and basic research skills. A 27-slide presentation was given that briefly introduced the library facilities, policies, using the online catalog and databases. Students were asked questions to determine if their short-term recall was positively affected by using clickers in the lecture. The author of this study concluded that students who didn't use clickers got the same percentage of correct answers as those who did.

Another case study was conducted that explored a game-centered approach to teaching library instruction. In this study, Walker (2009) created a Jeopardy game to teach students about different library resources. Walker concluded that students learn in a variety of ways, which supports the premise that developing pedagogical techniques that vary from the traditional lecture would be effective. Walker asserts that Net Gen students have shown to become bored during traditional, lecture-based library instruction, preferring sessions that feature current technology and include active learning activities (p. 382).

LESSON DEVELOPMENT

The purpose of "The Seven Deadly Sins of Plagiarism" lesson was to teach students how to identify plagiarism as they write and how to cite properly in their final research paper. Having previously taught the same material with limited success in a one-shot class session using PowerPoint slides and in-class exercises, it became apparent that an even more engaging method was needed. This lesson was created through a partnership between faculty and librarians at Dickinson College as a way to prevent plagiarism and promote academic integrity (Bombaro, 2007). First-year students at Dickinson College were required to attend this class session held by librarians outside of regular class times. To make the one-shot presentation engaging and to encourage student participation, the librarians thought the fun, interactive nature of clickers would present academic honesty in a non-threatening and humorous way (p. 299). Based on student performance, students left the lesson with a better understanding of plagiarism rules than they had before the lesson (p. 307). Positive student reactions left on comment cards claimed they had fun, were forced to pay attention and were learning from their mistakes (p. 307).

To adapt "The Seven Deadly Sins of Plagiarism" lesson, it was necessary to modify Dickinson College's PowerPoint presentation to teach Hunter College Library 100 students how to identify plagiarism and cite for the purposes of their research paper, so I omitted specific references to Dickinson College's academic integrity policies. To do this, I contacted Ms. Bombaro and requested a copy of "The Seven Deadly Sins of Plagiarism" PowerPoint file and asked permission to adapt it to suit the needs of my course. After obtaining this permission, I edited the lesson to replace Dickinson College references with Hunter College. I also used

Dickinson's handouts, which I modified to reflect the general content of the required research paper.

OUTCOMES

This section describes how the use of clickers as active learning tools meets the objectives set forth. Although no formal assessment was taken, students have made comments to me about our use of clickers during the citation lesson. These comments, and my observations of their responses during the session, will be used to illustrate how well objectives were met.

Objective 1: The use of clickers will motivate students to actively participate in class.

When working through the examples presented in class, the students volunteered their answers rather than being asked to participate and being called on. They were more alert and debated and defended their answers when other students disagreed. This led to open discussions on the exact nature of the plagiarism being debated and key concepts on proper citing were presented.

Objective 2: Clickers will reinforce the concepts of identifying plagiarism and incorporating proper citation methods in their final research projects.

In comparison to previous courses where traditional lecture-based instruction was used, there wasn't a notable difference between the final graded research projects. Both had approximately the same amount of citation errors, but neither engaged in plagiarism. Therefore, neither pedagogical approach had a more positive impact than the other in terms of how the students performed on their final projects.

Objective 3: Clickers will incorporate a multimedia format procuring a fun environment for both the students and the instructor.

Several students commented that they enjoyed using the clickers and would like using them more in future lessons. After the course concluded, online student evaluations supported the use of clickers in the classroom. While observing the students during the lesson, it was obvious that they were more engaged and alert while using clickers than they had been during previous lecture-based lessons. Using clickers helped test their response to different pedagogical approaches and resulted in more spontaneous learning activities that were met with enthusiasm.

CONCLUSIONS

While using clickers in library instruction was effective in teaching citing and plagiarism in Hunter College's Library 100 course, the requirements for implementing the lesson are more taxing on the instructor. The instructor must be dedicated to learning clicker software, as well as trouble-shooting as issues arise. Using clickers can help change the learning environment from lecture-based to active and spontaneous learning. Once students reacted positively to using clickers, it was obvi-

ous that they enjoyed learning in a variety of ways, raising their confidence to participate in other active-learning exercises.

Although this article supports the use of clickers to teach library instruction concepts and documents positive student feedback on their use, no evidence confirms a direct impact of the use of clickers on student performance. The quality of citing in the final research projects did not vary between the class that used the clickers and the class that did not. The objectives in implementing clickers in the classroom were:

- motivate students to actively participate in class
- incorporate proper citation methods in students final research projects
- create a fun learning environment for both the students and the instructor

On the basis of the positive student feedback on the use of clickers in the citing and plagiarism lesson, the author encourages the use of clickers in library instruction. While admitting that not all of the objectives were accomplished, using clickers was a positive experience and led to the development of future successful active learning exercises.

REFERENCES

- Bombaro, C. (2007). Using audience response technology to teach academic integrity "The seven deadly sins of plagiarism" at Dickinson College. *Reference Services Review*, 35(2).
- Bugeja, M. (2008). Classroom clickers and the cost of technology. *The Chronicle of Higher Education*, 55(15), A31.
- Dill, E. (2008). Do clickers improve library instruction? Lock in your answers now. *The Journal of Academic Librarianship*, 34(6), 527-529.
- Kaletka, R., & Joosten, T. (2007). Student response systems: a University of Wisconsin system study of clickers. *EDUCAUSE Center for Applied Research Bulletin*, 2007(10), 1-12.
- Keller, C., Finkelstein, N., Perkins, K., Pollock, S., Turpen, C., & Dubson, M. (2007). Research-based practices for effective clicker use. 2007 Physics Education Research Conference (pp. 128-131). Melville: American Institute of Physics.
- Patry, M. (2009). Clickers in large classes: From student perceptions towards an understanding of best practices. *International Journal for the Scholarship of Teaching & Learning*, 3(2), 1-11.
- Walker, B. E., (2009). This is jeopardy! An exciting approach to learning in library instruction. *Reference Services Review*, 35(4), 381-388.
- Windham, C. (2005). The student's perspective. In *Educating the Net Generation*. Retrieved from <http://www.educause.edu/educatingthenetgen/>