Implementing a learner response system in one university

Chris Campbell
School of Education
The University of Queensland

Although students expect to be engaged in lectures, it has been acknowledged that this can be challenging at universities across the world. When students lack engagement, attendance at lectures can be affected and students can become disengaged from the course. For these reasons and more it was decided by academics who lecture at one Australian university to implement a learner response system (LRS) for their large first year Education cohort. This paper investigates the literature and focuses on this implementation as well as initial data obtained by a group of first year students.

Keywords: learning response system (LRS), clickers, higher education, teacher education

Introduction

This paper describes the implementation process of a learner response system in a School of Education at one Australian University. There was a perceived need by some of the lecturers in the School to increase student engagement in lectures, particularly in the large first year lectures with several hundred students enrolled. The tertiary teaching environment requires us to be up-to-date with technology including what to use, how to use it, the rationale for using it and to be totally convinced of its merits. As lecturers, some technologies are helping us provide more flexibility in delivering course content (such as the availability of the Lectopia lecture recording system and the Blackboard learning management system) but these do not necessarily engage all students in a course. It can be a fine balance to maintain student engagement in a course when there is no longer a necessity for students to be physically present at a lecture. The possibilities for losing face-to-face contact with students, along with other debates around pedagogical practices such as including tutorial attendance in assessment, makes for a controversial space to discuss the relationship between new technologies and student engagement. With a diversity of tertiary students, many of whom are engaged in several hours paid work while being enrolled in university studies, and who are confident users of social media technologies, the challenges of maintaining engagement throughout the course of a lecture can quickly impact upon their level of success in the early part of the university studies.

There are many factors that determine whether lecturers will incorporate new technologies into the planning of their courses. Notwithstanding the time needed for professional development, there is an initial reluctance to trial new technologies with a new cohort of students, particularly in a first-year course. These courses often have large numbers of students who, at an early stage in their tertiary studies, can be reluctant to participate in class discussions. However, it is precisely because these large cohorts of students need to be able to quickly engage with both the course requirements as well as a new learning environment that there is an urgency to look for effective tools to enhance student participation. Another factor is the potential for new technologies to 'fall over' during lectures.

Literature Review

Clickers have been used in higher education for almost two decades and due to this there have been various types of research conducted on them. There is now a detailed body of literature that surrounds the implementation and use of clickers in various higher education contexts (For example: Barnett, 2006; Caldwell, 2007; Cheesman, Winograd, & Wehrman, 2010; Hall, Collier, Thomas, & Hilgers, 2005; Koenig, 2010; Milner-Bolotin, Antimirova, & Petrov, 2010; Strasser, 2010). They have particularly been used in science courses with large enrolments (Cheesman et al., 2010). In a study of first year physics students, the researchers defined clicker effectiveness as "student perception of how much clicker pedagogy helped them stay engaged in class, understand the material, get continuous formative feedback on their progress, clarify difficult concepts, and reflect on their own learning" (Milner-Bolotin et al., 2010, p. 16). Caldwell (2007) has suggested that using clickers offers a flexibility for learning as they can be used effectively in both lectures and tutorials and can be used with many different styles of questions. Trees and Jackson's research of 1500 undergraduates enrolled in seven large courses across three university departments have been reported and they suggest that there are a

number of factors contributing to student's positive reception to using the clickers in class. These include the view that traditional lecture styles aren't the best, a desire to be engaged and involved in the class, valuing feedback as well as previous experiences with lecture courses (Trees & Jackson, 2007).

By using clickers in large groups it allows both the students and the lecturer to get feedback. Students can be given feedback on their responses and the knowledge they have gained on a particular topic. In an earlier study it was reported that one of the positives about students using the clickers is that they like receiving feedback on how well they actually understand the material they are learning. Students also reported enjoying the interactivity in class (Barnett, 2006). However, much of this literature focuses on the use of clickers in sciences where short-answer responses can help students and lecturers monitor progress. It also allows the lecturer to have feedback on how well the students understand the content they are teaching (Lantz, 2010).

One study presents positive results in using clickers in teaching, although having to make significant changes to actual teaching to see these results (Kolikant, Drane, & Calkins, 2010). This study used clickers in undergraduate math and science classrooms in the United States and results suggest that the use of clickers does not generally occur instantaneously in the classroom but is a gradual one where the instructors firstly needed to overcome various challenges. However, the study suggests that the use of clickers "may act as a powerful catalyst to transform them, moving them from teacher-centered conceptions and approaches to teaching to student-centered conceptions and approaches" (Kolikant et al., 2010, p. 134).

Another quantitative study focusing on an undergraduate operations management course investigated how the use of clickers affected learning outcomes (Yourstone, Kraye, & Albaum, 2008). The results suggest that the use of clickers "can have an impact on student learning as measured by test scores" (Yourstone et al., 2008, p. 85). The authors of this paper go on to comment that it may not actually be the clicker technology that is responsible for the improved learning outcomes but the actual immediate feedback provided to the students through the use of the clickers.

Implementation and Methodology

After reviewing the available learner response systems it was decided that the School of Education would purchase the Promethean brand. So, in May, 2011, the School of Education purchased 64 ActivExpressions, the hand held learner response system and 300 licenses of ActivEngage. This is the online system where the students use their own laptops to complete responses in a lecture. Students are required to 'register' their device on the system at the beginning of each class or semester. As this can be time consuming, due to the students not having it set up or the correct wireless etc, it was decided that they would only be registered once per semester. This required all students who wished to use ActivEngage on their laptops to register at the one time or they would miss out. For the lecturer they could use a software program called ActivOffice to create the questions either prior to class or on the spot in the lecture. This program works in PowerPoint which is familiar to all lecturers. It also works in an interactive whiteboard software program called ActivInspire, which many lecturers are not familiar with.

ActivEngage was used as soon as it was purchased for 3 lectures in May 2011. The cohort were first year education students enrolled in a first year compulsory ICT course called Learning Tools for the 21st Century. The setup was almost one lecture in time and involved quite a few support people. Numerous problems were encountered at this lecture. These included students
- not have Eduroam wireless network preinstalled on their laptop computer,
- not downloading the installation file prior to class, and;
- not entering the registration details correctly while in class.

Students were given the one opportunity to register in this class for the rest of the lectures during the semester so it was important that problems were solved if possible.

In Semester 2, ActivEngage was initially used in a lecture for a first year sociology in Education course called Introduction to Education. However, due to difficulties in the lecture it was decided that the trial would continue with one tutorial group. As the group was approximately 20 students in size the ActivExpression devices were used most weeks for the rest of the semester. Results of this implementation were positive with tutorial attendance being high, and with the students "more confident and thoughtful in relation to providing responses to questions during class discussions" (Campbell & Monk, 2012, p. 5).

Semester 1, 2012, began full of promise and ActivEngage was introduced to both first year cohorts in the one lecture. This was planned for well and students were not allowed into the room unless they had Eduroam working on their computer (although they were sent to the library nearby to get it working so that they could come back). Some students had problems with the registration code, and although it took quite a bit of time it was much easier than previously. ActivEngage was then used for the next 11 weeks in the first year ICT course and it was used a total of four times in the first year sociology course.

The students in the first semester, first year ICT course had the opportunity to use ActivEngage each week in the lecture until the end of the semester. For those students who were unable to register their laptops it was discovered through trial and error that the ActivExpression devices would work in conjunction with ActivEngage. This meant that students could pick up a 'clicker' at the beginning of each lecture and both systems would appear to give one integrated approach to the user. The system was set up to allow the students to respond anonymously.

At the end of the semester the students in the course were asked to complete a survey about their experiences using the learner response system. They were asked how many lectures they attended as well as how many times they used the clickers. Students were then given a range of statements to state whether they strongly disagree, disagree, agree or strongly agree. From the 219 students enrolled in the course there were 111 students who participated in the survey. Students were also asked a range of open ended questions in order to ask them to explain their reasoning for the various answers. In this course there were three different ways in which the clickers were used. These were for research, in other words, the lecturer was trying to find out particular things, for formative questioning and for open ended opinion questions that the lecturer wanted the student's opinion about. Results show that students were positive about using the learner responses.

Students who attended the lectures were generally positive about the use of the LRS in the lectures. Students commented that the voting in class "reinforced information", "allowed for shared ideas and responses" and that "more feedback and clarification was possible". Open ended questions were often used in the lectures with students required to type in a text answer. This allowed for a variety of student responses, with one student commenting it enabled students to see "other views than my own". These responses suggest it can be a powerful teaching tool in the classroom, and not just in lecture theatres. Another student commented "found it amusing and fun to participate in a way that was new and different to ways of learning that I have previously experienced".

Further Directions

In Semester 2 this study will continue with an implementation in the first year sociology course. It will be used in nearly all lectures with a variety of guest lectures. This provides potential new research areas as most guest lecturers will not have experienced using a learner response system in their teaching and potentially an investigation will provide insight into changing pedagogy. Semester 2 students will also have an advantage with using this technology as there is now an App available for iPhones and Android devices. The App is being trial by Faculty IT and will be available for students to download in Semester 2. It is hoped that between using the laptops, apps or the ActivExpressions all students will have a device to use.

Conclusions

This paper describes an implementation process of a learner response type system at one university. It is hoped that by sharing this journey other universities may be able to avoid some of the problems that occurred during this period.

It does appear that the students engaged in the class with greater depth when they were able to use the clickers. Massingham and Herrington (2006) report in their study on student attitudes, participation, performance and attendance in tutorials and lectures that engaging students with greater depth is an important factor in lecture attendance. Thus, student engagement is an important aspect in lectures and by using clickers this may contribute in a positive way to the class.

This study concurs with previous research that students are more engaged in lectures when they are able to use a learner response system in class (Strasser, 2010). Using clickers in class also appears to allow the students to get continuous formative feedback on their progress (Milner-Bolotin et al., 2010) which students in this cohort also

commented on.

Although there were some initial problems setting the learner response system up, from student responses it appears to have been well worth the effort. The lecturers involved in this study look forward to using it again in Semester 2, 2012, and in the same courses next year with a new cohort of students.

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Author contact details:

Dr Chris Campbell, The University of Queensland, chris.campbell@uq.edu.au