Increasing in-class student engagement using Socrative (an online Student Response System)

Paul Dervan
paul.dervan@itb.ie
Faculty of Business
Institute of Technology, Blanchardstown
Dublin, Ireland

Abstract

This paper draws on primary and secondary research to analyse the effectiveness of the Socrative cloud-based Student Response System (SRS) in improving student engagement and the learning experience, compared with the traditional lecture setting.

For lecturers considering a move to a cloud-based SRS, this paper examines the potential pay-offs and pitfalls, identifies free online options available and assesses the efficacy of the Socrative SRS from the perspective of lecturers and students.

Keywords

Socrative, Lecture, Clicker, Student, Response, BYOD, Technology, Cloud, Learning

1. Introduction and Motivation

The purpose of this paper is to provide guidance to lecturers who may wish to improve student engagement during lectures by outlining research and drawing on the author's first- hand experience of using a free online Student Response System (known as Socrative). The system was used by the author to deliver lectures and tutorials to students taking Sports Management (2) module at the Institute of Technology, Blanchardstown (ITB) in 2013. The paper also reports on student perceptions of their experience using Socrative.

The author's general interest in educational technologies (and Socrative specifically) stems primarily from his experience as a Business Studies Lecturer and also from his participation (as a student) on the Dublin Institute of Technology (DIT) Teaching and Assessment at 3rd Level Certificate Course.

2. The Lecture – A Method for All Seasons?

Biggs and Tang (2007, p. 109) believe that the lecture has become 'the method for all seasons' and that this is 'probably because it conveniently accommodates large fluctuations in student numbers'. They also point out, inter alia, that lectures are quite ineffective for stimulating higher order thinking and that sustained and unchanging low level activity (listening to a lecture) lowers concentration and fails to address the fact that the attention span of students is typically 10 to 15 minutes after which learning drops off rapidly.

Notwithstanding these lecture-oriented challenges, Cavanagh (2011) believes that if cooperative learning and active student engagement can be introduced as part of the lecture, then higher student motivation, enhanced information retention, better student attitudes and improved critical thinking skills will result.

Terrion and Aceti (2012) have also highlighted the importance of student engagement to learning because unengaged students do not listen, or attend to the learning process. They also point out that technology may offer a means to enhance student engagement. Building on this latter point, one approach to enhance student

engagement (using technology) is to include the use of a Student Response System as part of a lecture.

3. Evolution of Student Response Systems

A Student Response System (SRS) is an electronic system which allows students to provide feedback and responses to questions and quizzes during a lecture.

Earlier SRS implementations involved students either individually or in teams being issued with a handset referred to as a 'clicker' at the start of the lecture. The 'clicker' communicates with software running on a PC connected to the overhead projector system. During the lecture, the lecturer can pause and present questions, quizzes or tasks to the students who then work on them individually or in teams. Using the 'clickers', feedback and answers are returned and presented visually on the screen where they can be viewed by all participants thus facilitating discussion or debate among the class on the range of answers provided. The lecturer can also assess the extent to which students understand the material based on the answers received.

Much of the research to date has been based on the use of 'clickers', however new cloud-based response systems are emerging driven by the reality that a majority of students have access to an internet-connected device. In the UK for example, the Universities and Colleges Admissions Service reported smartphone ownership at 82% among college freshers (UCAS, 2013). These new student response systems seek to exploit this ubiquitous access to the Internet on the basis that students bring their own device (BYOD). This approach avoids the need for 'clickers' with dedicated hardware & software (and associated costs).

Socrative (www.socrative.com) is a cloud-based response system which is available free of charge. The Socrative system can be accessed by students over a WiFi or mobile data connection using PCs, mobile phones and tablet devices. The Socrative system was used by the author in a number of lectures and tutorials delivered to 1st Year Sports Management students taking the Contemporary Sports Management Module (2) at the Institute of Technology, Blanchardstown.

There are other response system options available. Junkin and Cox (2012) have identified a number of free online systems as follows:

IPAL (http://www.compadre.org/ipal/webdocs/About.cfm)

Ubiquitous Pres (http://up.ucsd.edu/)

Poll Everywhere (http://www.polleverywhere.com/)

Google Moderator (https://www.google.com/moderator/)

Commercial online student response systems are also available for example, Top Hat (www.tophat.com) and OMBEA (www.ombea.com).

4. Benefits of Using a Student Response System

Citing a number of research studies, the benefits of using a student response system have been highlighted by Dublin Institute of Technology (DIT, 2011). In summary, such systems provide an immediate source of feedback for the academic and student, rapidly identifying areas of misunderstanding. Moreover, there is improved student interaction, engagement, active-learning, and participation. Significantly, students are enthusiastic towards their use and there are potential improvements in student learning and they drive increased levels of advance preparation

The University of Minnesota (2008) has identified reduced paperwork and labour associated with using tests and/or quizzes as well as automatic attendance taking to encourage increased class attendance. The use of an SRS can also facilitate what Mazur (2009) refers to as 'Peer Instruction' whereby students work initially individually on theory-based problems and then collaboratively to share their understanding of new concepts with their peers.

The impact of using an SRS on grades has been reported by Caldwell (2007). In a mathematics course it was found that the use of clickers 'increased the number of A's earned by 4.7%, reduced the rate of withdrawal by nearly 3%, and decreased the combined proportion of students earning D's, F's, or withdrawing by 3.8%[1]. These

---

[1] Caldwell points out that the findings relate to mathematics courses which were taught by the same instructor, the same semester, using the same course curricula, but in different rooms—one of which lacked a student response system. The total enrolments for the non-SRS and SRS courses were, respectively, 211 and 194

results suggest that active engagement in class boosts achievement for at least some students and prevents others from dropping or failing the course.' (Caldwell, p.13). More recently, Heaslip (2012) has reported that the use of an SRS increased the class average (final module result) for most of his modules by 8%.

5. Student Response Systems – Negative Student Perceptions

While the research cited above highlights many benefits to be gained through increasing student engagement using an SRS, Caldwell (2007, p. 15) makes the point that 'although negative responses are generally outnumbered by positive ones in any individual course, some general trends in complaints are notable'.

These complaints include the cost of having to pay for the use of a 'clicker' or if the educational institution provides the 'clicker', problems arising from lost 'clickers'. Furthermore, lecturers can be perceived to be messing around with technology rather than teaching, and technical problems with the software or the lecturer's lack of experience coupled with the use of the system to monitor attendance are issues likely to create student dissatisfaction. Additional concerns may be expressed by 'competitive' students who may not appreciate being made to 'cooperate' using a team-based response 'peer instruction' approach and some students may experience anxiety when class-based response system test grades are included as part of a student's overall grade. Finally, students are likely to be unhappy if they fail to perceive the value of the questions or if they conclude that the use of the response system is driving content.

Caldwell has provided a comprehensive list of 'Useful Tips' for lecturers planning to use a system such as Socrative. In the author's opinion, knowing why you are using the SRS and keeping this in mind when preparing quizzes is important. Moreover, getting student buy-in to the use of the system by explaining why you are using it and what you expect them to gain from the experience is useful. Finally, familiarising yourself with the system, and keeping a positive attitude while being willing to make a few mistakes are helpful guidelines.

6. Accessing and starting to use Socrative

Lecturers who wish to use the system must first register on www.socrative.com after which they are granted a 'virtual classroom' with a unique identifier (which can be altered by the lecturer). To use the system, the lecturer logs in using an e-mail address and a password. It is then possible to present students with pre-prepared (by the lecturer) questions or quizzes which they can work on individually or share quizzes in teams.

A particular strength of the system is that questions can be posed 'on the fly' using the classroom whiteboard during a lecture with students entering their responses to Socrative using mobile phones, tablets and PCs. The availability of the responses can be used to assess the degree of understanding and/or to provoke discussion.

Students logging in are requested to enter the virtual class identification number provided by their lecturer. They are then asked to enter a name to identify themselves. Once logged in, they can engage with the question(s) or tasks posed by the lecturer. Based on the author's experience, it is recommended that individual students (or teams) should be clearly identifiable to minimise abuse of the system through anonymity.

7. Using Socrative - Findings

The author used the system in two modes: a) posing questions on a whiteboard and getting students to provide responses during lectures using Socrative and b) using Socrative to deliver pre-prepared quizzes in tutorials. Experiences can be summarised as follows:

Student Perceptions

Sixty Five 1st Year Sports students taking Contemporary Sports Management 2 at ITB were surveyed in spring term 2013 via e-mail using a survey instrument prepared using the online Jotform application (www.jotform.com). Prior to circulation, the proposed survey questions were validated using a focus group of six students.

Twenty six valid responses were received (40% response rate)[2]. Table 7.1 below sets out details of the questions asked together with the answer mechanism. Table 7.2 highlights key findings.

Q1. Do you think the use of an in-class student response system such as Socrative was helpful to your learning? *Yes/No*
Q2. Thinking about HOW Socrative helped your learning, please provide your response to EACH statement below...   a) Using Socrative improved my engagement during lectures   b) The Socrative quizzes highlighted gaps in my knowledge   c) Socrative made the lectures more interactive   d) The team-based quizzes introduced a bit of competition   e) Feedback from Socrative helped the Lecturer understand where students had difficulty   f) Socrative was useful because it introduced a bit of fun into lectures   g) Using Socrative helped my understanding of course material   h) Socrative is very easy to use   Answer Mechanism: 4 point balanced Likert Scale with no mid-point.   *Answer text: Strongly Agree Agree/Disagree/Strongly Disagree*
Q3. Based on your experience of using Socrative this semester and thinking about next semester, please indicate your view as follows: I would like to see...   Answer Mechanism: 5 point balanced Likert Scale with mid-point.   *Answer Text: Use a lot more / Use more/OK now/Use less/Use a lot less*
Q4. Do you think there are disadvantages to using a feedback system such as Socrative? *Yes/No*
If Yes to Q4, student was prompted to expand on the perceived disadvantages

Table 7.1 – Survey Questions

Using Socrative ...	**Student Response**
It is easy (or very easy) to use (Yes)	96%
Improved my engagement (Agree/Strongly Agree)	92%
Use it more (or significantly more) next semester	77%
There are no perceived disadvantages[3]	58%

Table 7.2 – Results of Student Survey on the use of Socrative

---

[2] It is worth noting that the response rate was enhanced by a request to the Class Representative to publish the survey link on the class Facebook page.

[3] The balance of 42% indicate that perceived disadvantages include students not taking it seriously, making inappropriate comments, wasting time or making useless contributions.

One response highlighted the advantage that it allows quieter students to interact without the fear of making 'public' mistakes.

Of particular interest is how students believed the system helped their learning. This information is presented in Chart 7.1 below. Improving engagement during lectures, making lectures more interactive and helping with understanding of course material are consequences of using a system such as Socrative (based on this survey). Responses are not as strong for the system 'helping the lecturer to understand where students had difficulty' and perhaps there is scope for further research/reflection in this specific area.
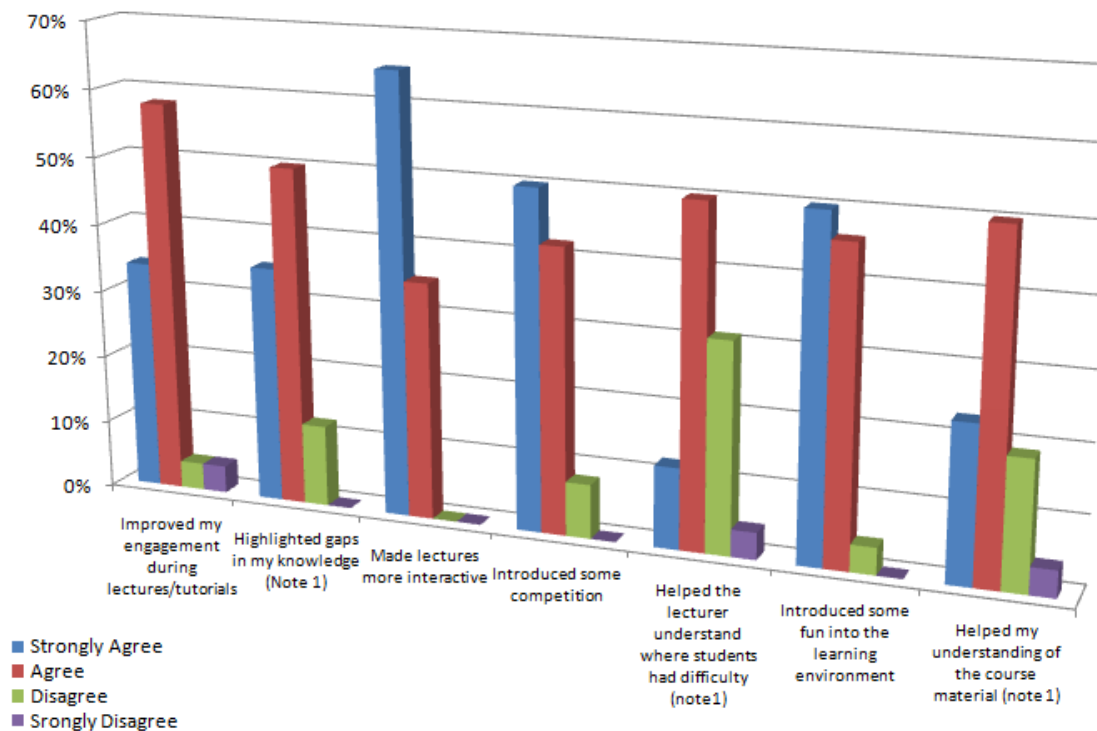

Chart 7.1 – How use of Socrative helped students' learning

Note 1: One response missing for these questions.

Technology - Ease of Use / User Experience

The Socrative System proved to be very reliable from both a lecturer and student perspective. There were no issues registering on the system as a lecturer and it was very easy to alter the assigned virtual class number to a six digit number that is easily

remembered by the lecturer. (In any event, class number is always displayed once the lecturer logs in). The online help available is very effective.

Students had no difficulty accessing the system from PCs and mobile phones in class. Socrative worked flawlessly in the classroom and there were no login or system issues experienced while the system was being used. It should be noted that students mostly worked in teams and that there were no more than 20 teams logged in at any one time. (Lecturers with larger classes should note that there is a 50 user limit per activity and they might wish to confer with their IT Support colleagues to identify potential location-specific bandwidth constraints before using Socrative in their institutions).

The quizzes and questions (prepared by the author) worked perfectly and were very easy to set up. Quizzes can also be shared on the Socrative system. Of particular benefit is the capability to download an Excel report once a quiz or 'space race'[4] has been executed. This allows the Lecturer and students to see precisely where there may be gaps in knowledge or understanding of concepts.

Additional Comments / Observations

Overall the use of Socrative was very positive and is borne out by student feedback although it is acknowledged that there is potential for bias towards positive answers given that the author surveyed his own students. Notwithstanding this potential bias, the benefits derived from use of the system are broadly consistent with research findings relating to 'clicker' use cited by DIT (2011).

There are some risks mainly relating to students who may seek to disrupt the class by providing inappropriate comments to 'open ended questions'. However, by ensuring there is no anonymity, lecturers who wish to use the system should find that this aspect of the technology can be effectively managed and controlled.

---

[4] 'Space Race' allows a quiz to be run as a race whereby the on-screen 'vehicles' of individuals or teams advance across the screen commensurate with the number of correct answers that are inputted.

One aspect of the system not assessed was 'Exit Ticket'. This function allows lecturers to take a 'pulse check' at the end of a lecture to identify content or concepts students believe they have learned (or not learned) during a particular session.

9. Conclusions and Future Work

Research suggests that the effectiveness of the lecture as a means of teaching is impaired as, inter alia, it promotes passivity and diminished concentration on the part of the student. Lecturers who wish to overcome these drawbacks should seek to increase the level of student engagement while delivering lectures.

The use of Socrative offers lecturers the opportunity to quickly and easily enhance the delivery of their lectures or tutorials in a way that increases interaction with students leading to a better learning experience for them.

The system is reliable and easy to use and feedback from students is positive. Specifically, 65% of students strongly agreed (and 35% agreed) that the use of Socrative increased interaction during lectures. 35% strongly agreed (and 50% agreed) that the use of the system highlighted gaps in their knowledge. Significantly, 77% students surveyed would like to see more (or significantly more) use of the system with 23% strongly agreeing (and 50% agreeing) that use of the system had helped them understand course concepts. Further research is merited in understanding how the system might be used more effectively to aid lecturers in identifying where students may be struggling with course concepts (as this was the weakest area in the student survey).

There are many useful online resources offering advice to lecturers who may wish creatively engage students using technology which is readily accessible, for example, Duncan (2008), Bruff (2013) and the University of British Columbia (2013) provide extensive resources to support lecturers who may wish to use a Student Response System during lectures. Caldwell (2007) also provides insightful support tips.

References

Biggs, J. and Tang, C. (2007). Teaching for Quality at University. 3rd ed. Maidenhead: Open University Press.

Bruff, D. (2013). Classroom Response Systems ("Clickers"). Available at http://cft.vanderbilt.edu/teaching-guides/technology/clickers/#news [retrieved on 26/09/2013].

Caldwell, J. E., (2007). Clickers in the Large Classroom and Best Practice Tips. Available at http://archive.alt.ac.uk/newsletter.alt.ac.uk/www.lifescied.org/cgi/reprint/6/1/9.pdf [retrieved on 11/09/2013].

Cavanagh, M. (2011). Students' experiences of active engagement through cooperative learning activities in lectures. Available at http://alh.sagepub.com.remote.library.dcu.ie/content/12/1/23.full.pdf+html [retrieved 16/09/2013]

Dublin Institute of Technology (2011). Enhancement of learning with classroom response systems (clickers) – Lecturer reports and feedback. Available at http://www.dit.ie/lttc/media/ditlttc/clickers/Clicker_report_July_2011.pdf [retrieved on 05/05/2013].

Duncan, D (2008). Tips for successful 'Clicker' Use. Available at http://www.cwsei.ubc.ca/resources/files/Tips_for_Successful_Clicker_Use_Duncan.pdf [retrieved on 26/09/2013].

Heaslip, G. (2012). Engaging students in university lectures using Clickers – enhancing classroom interactivity. Available at http://facultyblog.nuimbusiness.ie/2012/02/13/engaging-students-in-university-lectures-using-clickers-enhancing-classroom-interactivity/ [retrieved on 19/09/2013].

Junkin, B. & Cox, A. (2012). Beyond Clickers: Using Web-Based Polling Technologies to Enhance Student Engagement. Available at http://www.educause.edu/sites/default/files/library/presentations/SERC12/SESS09/Beyond%2BClickers.pdf [retrieved on 26/09/2013].

Mazur, E., (2009). Confessions of a Converted Lecturer. Available at http://www.youtube.com/watch?v=WwslBPj8GgI [retrieved on 03/09/2013].

Terrion, J. L., and Aceti, V. (2012). Perceptions of the effects of clicker technology on student learning and engagement: a study of freshmen Chemistry students. Available at http://www.researchinlearningtechnology.net/index.php/rlt/article/view/16150/html [retrieved on 16/09/2013].

Universities and Colleges Admissions Service (2013). Eight out of Ten Freshers now have smartphones. Available at http://www.ucasmedia.com/news/2013/eight-out-of-ten-freshers-have-smartphones [retrieved on 30/09/2013].

University of British Columbia (2013). Clicker Resources. Available at http://www.cwsei.ubc.ca/resources/clickers.htm#questions [retrieved on 26/09/2013].

University of Minnesota (2008). Student Response Systems Overview. Available at http://www.classroom.umn.edu/support/support-srs.html [retrieved on 09/09/2013].