Enhancing In-class Student Engagement Using Socrative (an Online Student Response System): A Report.

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Abstract

This practice improvement report draws on primary and secondary research to analyse the effectiveness of the (free) Socrative cloud-based (Internet) Student Response System (SRS) in enhancing student engagement and the learning experience, compared with the traditional lecture setting. The benefits of using a student feedback system are highlighted in research cited by Dublin Institute of Technology. Inter alia, this research indicates that clickers can provide an immediate source of feedback for the academic and student in the classroom as well as improving student interaction.

The Socrative SRS was used in a number of lectures and tutorials delivered to 1st Year Sports Management students taking the Contemporary Sports Management Module at the Institute of Technology, Blanchardstown (ITB).

This practice improvement report sets out the author's experience and provides the results of a survey conducted amongst the students who used the Socrative System. The findings are positive and in line with DIT's research. Areas for further research are proposed by the author.

Keywords: BOD, Clicker, Cloud, Lecture, Socrative, Student response system.

1. Introduction

The purpose of this report 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 Socrative, a free online Student Response System The system was first used by the author to deliver lectures and tutorials to students taking Sports Management (2) module at the Institute of Technology, Blanchardstown (ITB), Dublin in 2013. The report also documents students' 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.

1.1 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.

1.2 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 (refs?). 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). In Ireland, smartphone ownership among 15 to 35 year olds is estimated to be 96% (Thinkhouse, 2014). 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 including commercial online ones, for example Top Hat (www.Tophat.com) and OMBEA (www.ombea.com). However a detailed evaluation of these systems is beyond the scope of this report.

1.3 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 O'Keeffe (2011). In summary, such systems provide an immediate source of feedback for the academic and student, rapidly identifying areas of misunderstanding. Significantly, students are enthusiastic towards their use. Moreover, there are potential improvements in student learning coupled with increased levels of advance preparation, improved student interaction, engagement and active learning. Citing Bonwell and Eison, Prince (2004, p. 1) defines active learning as '*any instructional method that engages students in the learning process. In short, active learning requires students to do meaningful learning activities and think about what they are doing*'.

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 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%.

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.

1.4 Student response system – 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 more focused on technology than with 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 provides a comprehensive list of 'Useful Tips' for lecturers planning to use a system such as Socrative. In my opinion, knowing why one is using the SRS and keeping this in mind when quizzes are being prepared is important. Moreover, getting student buy-in to the use of the system by explaining why it is being used and the benefits that will accrue from the experience is useful. Finally, familiarising oneself with the system, and keeping a positive attitude while being willing to make a few mistakes are helpful guidelines.

1.5 Assessing Socrative and starting to use the system.

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.

2. Using Socrative.

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

2.1 Student Perceptions.

Sixty-five 1st Year Sports students taking Contemporary Sports Management 2 at ITB were surveyed anonymously in spring term 2013 via e-mail using a survey instrument containing author-generated questions and using the online Jotform application (www.jotform.com). Prior to circulation, the proposed survey questions were piloted using a focus group of six students. Twenty six valid responses were received (40% response rate)[2] . Table 1 below sets out details of the questions asked together with the answer mechanism. Table 2 highlights key findings.

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.

Table 1: Survey Questions

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.[3] *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 [4]/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

3 The author chose a 4 point scale in order to avoid central tendency bias in the answers to Question 2.

4 'OK Now' means students' perception of current Socrative usage is adequate

Table 2: Results of student survey on use of Socrative.

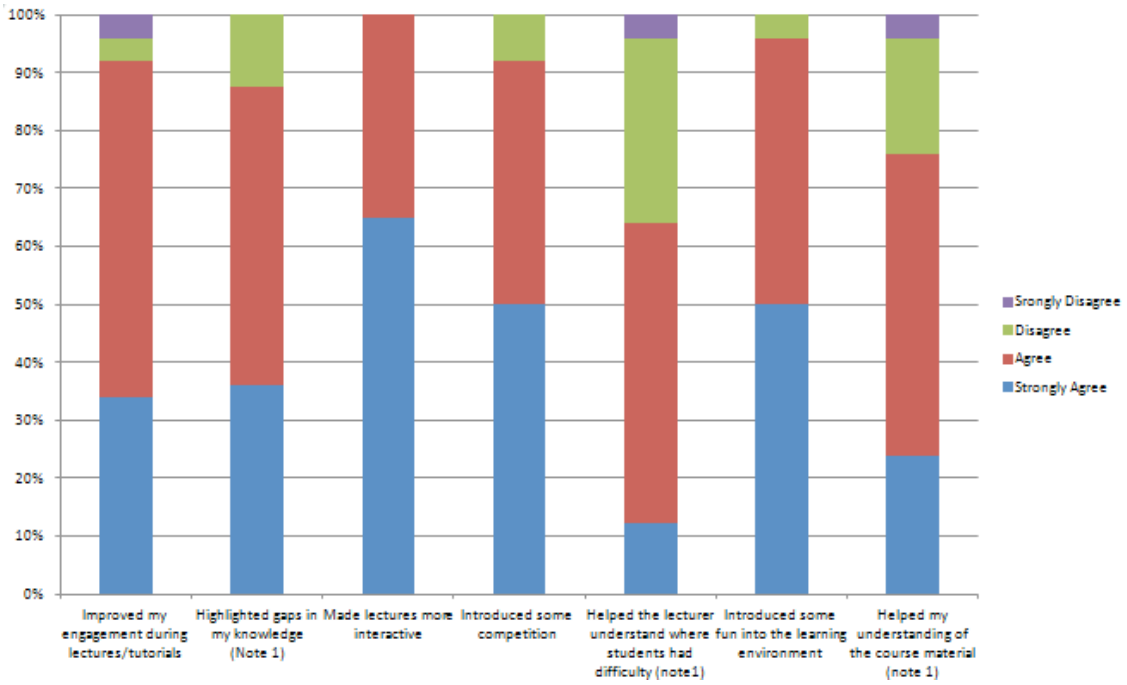
Using Socrative	**Student response (%)**
It is easy (or very easy) to use (Yes)	96.00%
Improved my engagement (Agree/Strongly Agree)	92.00%
Use it more (or significantly more) next semester	77.00%
There are no perceived disadvantages.[5]	58.00%

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 Figure 1. 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.

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

Figure 1: How use of Socrative helped students' learning.



2.2 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' [6]has been executed. This allows the Lecturer and students to see precisely where there may be gaps in knowledge or understanding of concepts.

2.3 Additional 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 O'Keeffe (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. 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.

6 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.

3. 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 to 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.

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