
Interaction and Engagement: What can MOOCs learn from clickers?

Dr Catherine Easton
Lecturer in Law

Overview:

- This workshop session seeks to:
- Outline the results of a number of studies undertaken to demonstrate the potential for the use of CRSs in legal education
- Determine the feasibility of using students' mobile phones to collect signals
- Highlight accessibility issues
- Introduce on-going research being carried out in association with Vanderbilt University
- Take the debate on clicker responses and engagement into the presentation of MOOCs

Overview of the research

- **1st Project (2009)**

- Two Lecture Series presented using clicker technology
- Paper-based student survey
- Online staff survey
- Published as: Easton, C. An Examination of Clicker Technology Use in Legal Education *Journal of Information Law and Technology* 2009 (3)
http://www2.warwick.ac.uk/fac/soc/law/elj/jilt/2009_3/easton/

- **2nd Project (2010)** (building on key issues raised in the first

- Two Lecture Series presented using clicker technology
- Paper-based student survey
- Staff survey highlighting key chosen issues
- Published as: Easton, C. Employing a CRS to Teach Law: A Case Study *European Journal of Law and Technology* 2012 3 (1) <http://ejlt.org//article/view/129>

Current Research: Funded by the HEA

- • To further the pedagogical understanding of the rationale behind and impact of the use of interactive learning technologies in higher education.
- • To carry out research that seeks to evaluate the impact of the use of interactive learning technologies on retention and student success.
- • To investigate how interactive learning technologies can be effectively used to support flexible learning strategies such as MOOCs.
- • To analyse key issues relating to the uptake of interactive learning technologies and its impact upon staff satisfaction.

Why Vanderbilt?



Literature Review

- This technology can be used to teach law and can facilitate:
- The assessment of prior understanding (Herr, 1994)
- The provision of formative feedback (Roschelle et al, 2004)
- The provision of breaks in the presentation of a lecture (Tanner, 2005)
- The administration of summative assessments (Bernstein, 2001)
- The promotion of peer learning (Crouch and Mazur, 2001)
- The promotion of attendance (Sharma, 2005)

Meta-analysis: Caldwell, J. Clickers in the Large Classroom: Current Research and Best-Practice Tips CBE Life Science Education Spring 2007 6 (1) pp9-20

1st Project: Overview of student survey results

| Statement posed in the student questionnaire Fulltime(FT) Part-time(PT) | Strongly agree | Agree | Neutral | Disagree | Strongly disagree |
|-------------------------------------------------------------------------------------------------------|--------------------|------------|-----------|------------|-------------------|
| I feel that the lecture time would have been better used by the lecturer giving a traditional lecture | FT: 0% PT: 0% | 3% 0% | 7% 5% | 15% 15% | 75% 80% |
| Use of the clickers helped me to gauge my own knowledge in relation to the material | FT: 63% PT: 85% | 19% 10% | 16% 5% | 2% 0% | 0% 0% |

Further Results

- Strongly Agree *Agree *Neutral *Disagree *Strongly Disagree

| | | | | | |
|----------------------------------------------------------------------------------------|---------|-----|-----|----|----|
| The session with the clickers was well-organised and aided my own independent learning | FT: 68% | 17% | 13% | 2% | 0% |
| | PT: 80% | 20% | 0% | 0% | 0% |
| The session with the clickers aided my interaction with others in the cohort | FT: 35% | 20% | 38% | 7% | 0% |
| | PT: 30% | 35% | 25% | 5% | 5% |

Student Survey: Open Responses

- Student questionnaire-Fulltime:
- *“Using the clickers to answer questions allows me to know when I am wrong and this has brought awareness of topics where I need to do further background reading.”*
- *“They help to gain a better understanding for kinaesthetic learners like myself.”*
- *“They kept me awake!”*
- Student questionnaire-Part-time:
- *“We’re able to ascertain whether our learning is in-line with others, whether we’re struggling with a specific topic area but not communicating this to the lecturer. Concentrated much more.”*

Negative Student Responses

- *“Using the clicker is ‘fun’ but I feel that using them all the time could distract everyone from the actual lecture.”* Student questionnaire-Fulltime

Lecturer Responses

- There needs to be... *“an expectation on the part of students that lectures require energy and focus from them as well as the lecturer - lectures may be entertaining but they should not have to be.”*
- *“There may be a danger in doing activities that actually add little to the learning, but are instead just there to keep the students happy. Sometimes not everything can be fun and games!”* MMU Lecturer questionnaire: Lecture interactivity
- On answering the lecturer questionnaire 76% of respondents agreed or strongly agreed with the statement that: *“Students should be able to engage effectively with a traditional non-reciprocal didactic lecture”*.

Key Themes

- Interactive technology and the “Millennial learner”
- *“There may be a danger in doing activities that actually add little to the learning, but are instead just there to keep the students happy. Sometimes not everything can be fun and games!”* MMU Lecturer questionnaire: Lecture interactivity
- The “teachable” moment (Sabine, 2005)
- Anonymity (Draper and Brown, 2004)
- *“The clickers allowed students to speak up and say whether they understood something or not, whereas the individual would just stay quiet in order not to look stupid.”* Student questionnaire: Full-time

Factors inhibiting clicker uptake

■ With any teaching and learning innovation there are a number of factors which across all higher institutions affect widespread employment and engagement with new technology. These include a lack of management commitment, a lack of adequate training, past educational experiences and the drive to teach as we have been taught (Timmermann, 2003). Dufresne et al. (1996) present these issues as inhibitors to the institution-wide uptake of technology such as clickers and state that further factors include:

- ❖ Pressure to cover content
- ❖ Lecture theatre management
- ❖ Fear of technology – (on the part of both lecturer and student)

“I specifically need more experience in using clickers especially when I do not use a mobile but with more experience I see this method of lecturing as supportive in knowledge acquisition and interaction with fellow students.” Student questionnaire-part-time

Focus of 2nd project

- From the first project, a number of key areas for development were identified:
 - 1. What is the potential for using students' mobile phones to transmit the required signals?
 - 2. How can this technology be accessible to all?
 - 3. How could this technology be used to assess summatively in a law course?

Potential for mobile phone use

- Systems such as Poll Everywhere: <http://www.polleverywhere.com/> allow educators to manipulate the responses of student mobile phones. This is free for up to 40 responders.
- This would avoid the need for staff to carry heavy bags of equipment. Staff CRS-user response:
- *“it needs to be fully integrated in teaching suites. At present staff have to cart the equipment about and set it up. This is both time-consuming and problematic”*. Lecturer Survey

Key issues:

- Using a system based on text messages incurs a cost. Cheung (2008) gave the students a cash rebate to cover text message costs.
- Students can respond for free using web-based applications but this would involve ownership of web-enabled phones.

Research findings

- 100% of the 242 students surveyed owned a mobile phone (quite an obvious result)
- Of these 62% owned a mobile phone which would allow them to download an application
- Of these, a response of 2.8 (5=strongly agree) to the stem: *“I would be willing to download an application which would allow me to use my mobile phone as a CRS”*
- Conclusions: using students’ mobile phones to transmit signals would be cheaper and would remove some equipment-based practical issues
- However, there are potential direct costs of text messaging which need to be overcome

Accessibility: Key issues

Anticipatory reasonable adjustment duties are created by the Special Educational Needs and Disability Act 2001 and the Equality Act 2010

Feyen (2008): use of clicker technology can improve the learning experience for students with learning and psychological impairments. However, for others they can be inaccessible.

Responses: The software provider can give access to handsets with Braille response pads or vibrating signal transmission. Accessibility-enabled laptops can be used to transmit signals.

Accessibility: Research findings

- The Personal Learning Plans of the students were examined to determine any specific accessibility-related needs. A laptop would have been provided if any were determined.
- In order to reduce any anxiety among students at the use of a new technology the rationale behind the employment of the CRS and how it was going to be used was clearly explained at the beginning of each session.

Summative assessment: key issues

- CONTEXT: Burnstein and Lederman, 2001 and Hake, 1998 in science-based subjects found that students' final grades improved when a small percentage (10%-15%) was assessed using a CRS. The improvements increased the greater the percentage attached to the responses.
- **2nd Project findings:** 1.8 (5= strongly agree) response was given to the stem:
- *"I would be comfortable if a small percentage of my mark for this course were assessed through CRS use in lecture"*
- Expanding on this:
- *"It will put too much pressure on lectures"*
- *"I would rather all of my mark came from work I'd prepared for with revision or coursework".*

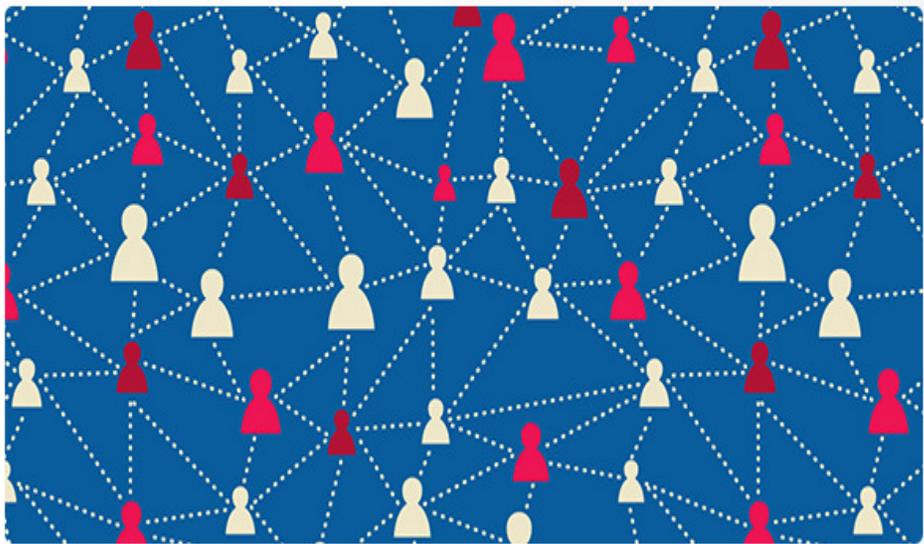
Current Research

- Scoping visit in November 2012
- Follow up in April 2013
- Preliminary Findings:
 - ❖ On-going strategic use of the technology across the institution
 - ❖ Students purchase their own clicker
 - ❖ Used in small and large groups. Need for on-going staff evaluation.
 - ❖ Innovative teaching strategies include assessing an entire course through student-created CRS questions
 - ❖ Moving on to MOOCs...



FUTURELEARN

MOOCS EXPLAINED NEWS ABOUT CONTACT / FAQs



Futurelearn will bring together a range of free, open, online courses from leading UK universities, in the same place and under the same brand.

Interview with Martin Bean, Vice-Chancellor The Open University

Martin Bean talks in depth about plans to offer free open online courses with UK

News

Top UK Institutions Take Futurelearn to India on PM Trade Mission

19 Feb 2013

Prime Minister welcomes Futurelearn expansion as British Library and five universities join

18 Feb 2013

OU and Futurelearn chiefs lead innovation master class at Nesta

22 Jan 2013

[▶ SIGN UP TO MAILING LIST](#)

@future_learn

Chair @Future_learn & VC @OpenUniversity Martin Bean



Massive Open Online Courses

- Based in early initiatives in connectivism
- They are freely available online and can support large-scale participation
- They can support peer learning but they are not standardised – tutor input is essential
- MOOC Honour Code:
- *1.I will register for only one account.*
- *2.My answers to homework, quizzes and exams will be my own work (except for assignments that explicitly permit collaboration).*
- *3.I will not make solutions to homework, quizzes or exams available to anyone else. This includes both solutions written by me, as well as any official solutions provided by the course staff.*
- *4.I will not engage in any other activities that will dishonestly improve my results or dishonestly improve/hurt the results of others.*
- **E-learning and Digital Cultures**

MOOC: Data Mining Questions

- 1. What effects do robo-graded assignments vs. peer-graded assignments have on ...persistence in the course? ...student activity patterns?
- 2. What effects do peer-graded assignments vs. discussion forum interactions have on peer-to-peer learning within a course?
- **3. What effects on student learning do different kind of “pop-up” questions during lecture videos have?**
 - **a. Questions at different levels of Bloom’s taxonomy (recall, understand, apply, analyze, evaluate, create)**
 - **b. Subtle changes in the presentation of questions (e.g. bolding the word “NOT” in a multiple-choice question)**
- 4. What effects do variations in student backgrounds (e.g. experienced with content vs. complete novice) and motivations (for taking the course) have on ...student activity patterns? ...persistence?

MOOCs and Engagement

- Aim: to extent and adapt the pedagogy relating to “real world” clickers and apply this to the ability for MOOCs to harness the benefits of interaction.
- Perceived Danger of MOOCs: That the community building benefits are lost as didactic methods are “resurrected”.
- Research involves observing the working group on the development of MOOC pedagogy and examining a number of MOOCs and analysing interactive features

CRS Practical Guidance:

- The students surveyed showed an initial reluctance for a percentage of their final mark to be awarded based on in-class CRS performance.
- If a decision were taken to assess a part of a law module using a CRS then this would have to be based on a focused teaching and learning strategy which took into account issues of accessibility and exceptional circumstances.
- If a small percentage of a module's marks (eg 10%) were assigned to CRS use then the benefits of increased engagement could improve assessment grades overall.

CRS Practical Guidance

- It is recommended that due to the positive impact it has on student engagement and related benefits, a CRS should be strategically employed on a law degree in the presentation of at least one core module.
- If a CRS is to be used in a lecture series then this should be communicated to the students at the beginning of the course and included in the relevant course literature.
- The employment of a CRS within a module presentation needs to be achieved in a strategic manner with a strong pedagogical rationale underpinning its use.
- All aspects of the technology should be fully tested before its use. CRS questions should only be employed when it is perceived that they will add value to the lecture presentation.

CRS Practical Guidance

- The available CRS system should be examined in order to determine the alternative, accessible technology it supports. This should then be assessed in relation to any Personal Learning Plans of students in the cohort, before the lecture series commences. The rationale behind the use of the system should be fully and clearly explained in order to minimise potential student anxiety.
- The educator should arrive in the lecture theatre as early as possible before the session begins. The computer system and software should be switched on and engaged as soon as possible
- .A guide to registering CRS handsets should be shown on a large screen as the students enter the lecture theatre, allowing them to register their handsets as early as possible.
- Questions should only be posed when it is deemed that they will add value to the specific material covered.

CRS Practical Guidance

- If a CRS is employed to monitor attendance then the rationale behind attendance monitoring and any associated sanction needs to be fully explained to the students.
- CRS questions can be posed in a way which supports peer learning through, for example, asking the students to work in small groups and determine a joint answer to a question posed or through Likert-scale questions which assess the opinions of large groups.
- A CRS can be used to assess summatively, however, if this decision is taken then the rationale behind it needs to be fully explained to the students. Students may be more willing to engage with this within an assessment regime if only a small percentage of the marks available, for example 10-15%, are awarded for responses in lectures.

Wider use of the technology in legal education

- USE IN LAW:
- Paul Caron (2005):
- *“after calling on a student to relay the facts of the case, I ask the students which of the opinions best resolves the legal issue at hand and then call on students to explain their choices. When the discussion is complete, I ask the students to again choose their favorite opinion, and several students typically will change their “vote” in light of the discussion and choose another of the opinions as their favorite. These approaches, of course, work just as well (if not better) in courses like Constitutional Law than they do in courses like Tax.”*

Examples of use on a public law course

- Parliamentary sovereignty and the EU
- Assessment of prior learning: Based upon the material covered in the previous lecture the students were asked to type in the number of Member States of the EU. This was followed by a multiple choice question based upon parliamentary sovereignty and implied repeal.
- Peer learning: The students were asked to discuss in small groups the whether or not the following statement was true or false “Parliament cannot amend the Bill of Rights” and submit answers via clickers. The same approach was taken with the statement “Where two Acts of Parliament conflict the courts will apply the earlier one”. The students were called upon to discuss how they alighted upon their answer and whether they understood why they were correct/incorrect.
- Community building: A Likert scale question was developed to elicit answers to the statement: “I am confident that I can stand up and pronounce the case name: *Internationale Handelsgesellschaft mbH v Einfuhr und Vorratsstelle fur getreide und futtermittel*”. Only one student responded to this with “Strongly agree”, he stood up and pronounced the name beautifully to loud applause from the rest of the cohort.

Overall Conclusions

- This technology can be harnessed to increase the engagement and success of students even in conceptual subjects. Law students respond positively to its use.
- Given recent changes to higher education, courses need to focus on generating a high level of student satisfaction.
- Clicker technology presents an unrivalled opportunity to develop an engaged community of conceptually-focused, problem-solving legal learners but this can only be achieved through the engagement and commitment of managers, lecturers and ultimately the students themselves.
- Translating these findings to the world of MOOCs requires an assessment of what works in a virtual context and an understanding of the nature of the “MOOC learner”.

Further Conclusions

- Overuse of a CRS can lead to a perception that time is being wasted. The placement of CRS questions in a lecture presentation should be strategically chosen to provide breaks from the flow of the lecture at approximately 10-15 minute intervals. CRS questions should be designed to test students' understanding of key concepts.
- The educator should then be prepared to revisit concepts if a low level of understanding is perceived. If a CRS is to be used to monitor attendance then there is a need to embed the CRS within a strategic teaching and learning framework which validates its use and demonstrates its wider benefits to the students.

References

- Bruff, D. *Teaching with Classroom Response Systems* San Francisco: Jossey-Bass 2009
- Burnstein, R. and Lederman, L. (2001) Using Wireless Keypads in Lecture Classes *The Physics Teacher* 39 pp8-11
<http://www.replysystems.com/pdfs/benefits/24.pdf> [Accessed 03/07/10]
- Caldwell, J. Clickers in the Large Classroom: Current Research and Best-Practice Tips CBE *Life Science Education* Spring 2007 6 (1) pp9-20
- Caron, P and Gely, R. (2004) Taking back the law school classroom: Using technology to foster active student learning *Journal of Legal Education*, Vol. 54
- Cheung, S. Using mobile phone messaging as a response medium in classroom experiments *Journal of Economics Education* 2008 39 (1) pp51-67
- Easton, C. An Examination of Clicker Technology Use in Legal Education, *Journal of Information, Law & Technology (JILT)* 2009 (3) <http://go.warwick.ac.uk/jilt/2009_3/easton>
- Feyen, S. *Classroom response systems: An accessibility viewpoint* Michigan State University Resource Center for Persons with Disabilities 2008
- Hake, R. (1998) Interactive Engagement Versus Traditional Methods: a Six-Thousand Student Survey of Mechanics Test Data for Introductory Physics Courses *American Journal of Physics* 66 (1) pp64-74