Engaging students through electronic voting – clickers and mobile phone systems

Poll Everywhere in use at the MIT 100K awards

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Aims of session:

• To explain EVS and identify some of the main systems

• To look at past research into how it has been used in teaching and to assess its benefits

• To assess whether it can help in teaching/learning law
What is EVS (PRS) (ARS)?

The audience respond to polls (usually multi choice questions) during lectures /classes using an electronic voting device.
Background to using EVS in teaching

- Sprang from recognition of interactive teaching pedagogy
- Mainly from research in the USA
- The teaching pedagogy that EVS supports has been researched for over 20 years (not necessarily using EVS)
- Based on student discussion/ interaction within the classroom, including in lectures


Department of Physics, Harvard University – research from 10 years of teaching with algebra and physics classes taught with ‘Peer Instruction’. This involves the following:
• Students are presented with questions

• They formulate individual answers and report their answers to the instructor

• Students then discuss their answers with those around them

• At the end of the discussion students are polled for their answers which may have changed based on the discussion
The authors’ conclusions:

• Peer Instruction (PI) increased student mastery of both conceptual reasoning and problem solving

• Students were more motivated

• Reactions to PI were generally positive

However....

There were always some students resistant to being taught in a non-traditional manner
As a result of research like this many educational establishments started experimenting with technology designed to support this pedagogy

EVS (PRS) can be used in this process

**Main Systems**

There are various voting systems on the market, for example, those that use **clickers**....
How it works......

• Tutors download (usually) free software from the provider
• This enables polls to be devised and inserted into PowerPoint presentations
• Multi choice polls but ‘free polls’ are sometimes an option
• Students vote using a hand held voting device (‘clicker’)
• The ‘clicker’ is a wireless keypad handset
• Each ‘clicker’ communicates wirelessly via a USB receiver which is connected to the computer
• Results instantly generated & displayed in graphs on screen
• Tutors can provide secondary questions
• Tutors can use leader boards etc if they wish
• Tutors can view stats over a course of time
Here is an example of a ‘clicker’ result graph (using TurningPoint)

....
D said to V that if V did not start to clear the ice from his path he would get a snowball in the neck there and then. Did V apprehend an immediate battery?

1. Yes because he anticipated some harm/pain
2. Yes because there were words and gestures as required
3. Yes because D imposed a condition for it not to occur
4. No because D’s words negated an assault
A different system is the use of mobile phones / laptops as voting devices

- Polls are also created within the free software
- Students can vote by text, smartphone, website, twitter

‘Poll Everywhere’ (uses mobile phones)

Some clicker providers have the technology to allow students to use their phones etc (ResponseWare). Sian Lindsay at City University has been researching this technology
Research into the effectiveness of using EVS

Most research in the UK has been conducted by Stephen Draper and colleagues at the University of Glasgow

Draper, S.W., Cargill, J., & Cutts, Q. (2002) "Electronically enhanced classroom interaction" *Australian journal of educational technology* vol.18 no.1 pp.13-23

Stephen has been using EVS in the UK for about 10 years (psychology)

He has researched the pedagogical benefits of using EVS which are summarised to be the following:
Assessment

Formative and as a practice for summative

Here multi-choice questions test content knowledge

Advantages of using EVS here:

• "Marking" is fully automatic
• Students know immediately if they gave the right or wrong answer
• Students know how their performance compares to the group as a whole
• Tutors see immediately how well the class measures up on that question
• Tutors can give tailored explanations focussing on wrong answers
Increase discussion in class/lectures

EVS supports the Peer Instruction method researched by Crouch & Mazur

Of particular use in large lectures where there is a lack of interaction and passivity imposed on the audience

Large numbers can prevent learners asking sufficient questions because of embarrassment / lack of time

EVS allows all to answer rather than just the ‘usual students’

Tutors can tailor rest of session in response
Is this better than the alternatives?

- **Show of hands- is not private / not a secret ballot**

- **White boards etc only allow near neighbours to see a student's selection**

- **EVS also provides faster and more accurate counting of the results: most presenters will only estimate shows of hands to about the nearest 20%, ( see the ‘Apprentice’ )**
Formative course feedback from students

Is usually a questionnaire at the end of the course, so after the ‘horse has bolted’

EVS anonymous polls during the year can assess student feedback & changes can be made that positively affect that cohort of students

Peer assessment

It can be used by students to assess each other (e.g. students can vote on a list of criteria re: student class presentations)
Community mutual awareness building
Especially during induction

Sessions requiring human responses
Also for research

Relations with tutor
Also makes students feel the teacher is taking special trouble over the teaching

Student Engagement (variation/breaks/attendance)
Not specifically mentioned in this research
Other research in the UK….


• Students (engineering) are generally, although not universally, enthusiastic about this approach
• Even over long periods (e.g. regular use throughout a year)
• When asked if they regarded EVS as an advantage or not, classes typically show a spread of opinion such as 70% for it, 20% indifferent, 10% definitely opposed to it

There is a group within the UK dedicated to exploring the use and effectiveness of in class technology, including EVS *(ESTICT)*

http://estict.ning.com

Many are using the technology but mainly within engineering, maths, science and ICT

To my knowledge no one else at *ETSTICT* from law
I am aware that there are those using this technology in HE....but I wanted to do my own study on the impact of EVS on learning/teaching law.

Quick practical demonstration and then discussion of my main research results.

As more likely to be using clickers, the demonstration is with the mobile phone method.
Cost to students – depends on their text package – they are texting a UK number

Students can also vote via web / Smartphone and Twitter

It is possible to track individual responses (either by mobile phone or by assigning a code/ number to each phone number)

http://www.polleverywhere.com/
Delegates then voted using their phones - the following are screen shots of the questions with the results tables that were generated at the time (the first screen shot about Jupiter was just to get delegates used to the voting) ....-

How many moons does the planet Jupiter have?

- Text a **KEYWORD** to +447624806527
- Tweet @poll and a **KEYWORD**
- Submit a **KEYWORD** to http://poll4.com

<table>
<thead>
<tr>
<th>Number</th>
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<td>63</td>
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<td>16</td>
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<td>26</td>
<td>JUP26</td>
</tr>
</tbody>
</table>

Total Results: 10
How many moons does the planet Jupiter have?

- Text a **KEYWORD** to **+447624806527**
- Tweet @**poll** and a **KEYWORD**
- Submit a **KEYWORD** to **http://poll4.com**
Can a crime be committed where D fails to act?

- Text a **KEYWORD** to +447624806527
- Tweet @poll and a **KEYWORD**
- Submit a **KEYWORD** to [http://poll4.com](http://poll4.com)

- Yes, if it is a crime that can be committed by failing to act and there is a duty of care owed by D to V
- Yes, if a statutory crime and there is a duty of care owed by D to V
- Yes, if there is a duty of care owed by D to V
- No, a positive act is required, as held in Fagan v MPC

Total Results: 52
Can a crime be committed where D fails to act?

Text a **KEYWORD** to **+447624806527**

Tweet @poll and a **KEYWORD**

Submit a **KEYWORD** to [http://poll4.com](http://poll4.com)

![Bar Chart](chart.png)

Yes, if it is a crime that can be committed by failing to act and there is a duty of care owed by D to V

**LAW32**

Yes, if a statutory crime and there is a duty of care owed by D to V

**LAW33**

Yes, if there is a duty of care owed by D to V

**LAW34**

No, a positive act is required, as held in Fagan v MPC

**LAW35**

Total Results: 52
This was an example of a free text where students can text their answers

in....

Are there any topics in the Law of Evidence that you feel you are struggling with?

Text EVJP and your message to +447624806527

Tweet @poll EVJP and your message

Submit EVJP and your message to http://poll4.com

"bad character– can we go over the gateways please?"

7 days ago
Which of the following are you most worried about regarding starting university

To vote: Text a CODE to +447624806527

- Completing the registration process
- Using the IT system
- Coping with the financial pressures
- My student loan
- Accommodation and who can help here
- Coping being away from home
- Making friends
- How to find out about/join clubs &...
- Getting lost on campus
- Where to go for help with general...
- Where to go for help with personal...
- Whether I will enjoy the course
- Coping with the academic demands
- Where to go for academic help
- What to do if I can’t attend
- I am not worried about anything
- Other worry not listed

0%  20%  40%
The system costs about £40 per month for up to 250 students – ‘roll on and off’ as and when you like

Two people can use the system for that price (but can cheat with generic email address)

It is free for classes up to 30 (seminars)

The company provide packages for HE
My Research

I used the system for 5 weeks in 2 hour Criminal Law lectures (130 students)

Multi choice Qs

3 per week before /after break/end

15 minutes per week
Research results

• 79 responses

• 100% bring phone to University

• 67% - unlimited tariff
On cost of voting

67% - ‘excellent or good’ (including 47% of those on limited tariffs)

Another 28% of the total said reasonable. Only 2 students said unreasonable

Time taken up in the lecture

• 73 responses

• 87% - ‘just right’

• 9% - too much (1x disruptive, 1x wanted more time spent on the lecture, 4x said was a waste of time)

• 4% - not enough dedicated to EVS and asked for more questions
Benefits/ non benefit to lecture experience?

This was an open question- there were 93 separate comments

- 23 (25%) - it tested their understanding
- 18 (20%) - it provided a break in the lecture and therefore variety
- 16 (17%) - it made the lectures more interactive
- 10 - it made the lectures interesting and / or fun
- 10 - it allowed revision of the main points & provided clarity
- 4 said that it helped maintain their attention
3 negative comments ................
2 - it took up too much time
1 - it was disruptive

Benefit/non benefit to understanding the subject/topic?

Open question - 53 responses (many put general comments like ‘see comments above’ or ‘there are lots of benefits’)

• 23 (43%) - it showed them points they had understood and misunderstood
• 9 - it made them think more deeply about the issues
• 4 - it prevented embarrassment
• 3 - it maintained attention
• Should we continue to use EVS in Criminal Law / use it in other subjects/ in seminars

• 72 responses

• Yes - Criminal law – 97%
• Yes - Other subjects (lectures) – 91%
• Yes - Seminars – 55%

• 17% who did not participate gave the following reasons:
• Voted with a friend and their phone
• 13 students could not get a signal (Orange)
• Battery was low/out
• 4 students said cost (not on text packages etc)
I asked similar questions re: the clicker system which I also used for 5 weeks – very comparable results

At the end of the 10 week period students were asked about their overall view of EVS

- **44%** Positive at first and became more positive
- **42%** Positive at first and remained same level
- **1%** Positive at first but became less positive
- **13%** Not positive at first but became positive
- **0%** Not positive at any stage
Clickers or phones?

- 94% clickers
- 6% phones

Reasons

- Nearly all said because clicker quicker and easier to vote – With phones some said focusing more on getting phone number correct but did not use keywords or store number
My preference? - phones

- Cheaper than clickers
- Easy to set up a poll and download into PP
- It does not disrupt lectures (in 5 weeks there were no interruptions with phones going off) and less hassle/time
- Prefer live moving graphs
- Some of the clickers did not register
- Students are unlikely to forget their phones
- More fiddly saving data with clickers
- Remote voting
- All staff can use in seminars up to 30
- User friendly
- E-mail support
Conclusion:

EVS probably aids understanding, but questions that can be asked are limited re: law when compared with maths, science etc.

At the very least it engages students in lectures and provides variety and a more interesting lecture experience.
Thanks for listening- Please ask questions!

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