Achieving feedback at scale with Electronic Voting Systems
Schedule

• Determine motivations for the use of EVS to enhance the student learning experience.

• Examine case studies of use and evaluate the effectiveness of the technology.

• Explore briefly the different types of EVS, acknowledging their affordances and limitations.
Which team won the World Cup Final 2014?

a. Argentina
b. Germany
c. England
A different way

• Go to ra.ombea.com

• Login with the Session ID 720370
How did you get to campus this morning?

a. Car – "I drove"
b. Car – "I was a passenger"
c. Walk
d. Run
e. Cycle
f. Bus
g. Living on campus
h. None of the above
In summary

• Users **participate actively** in a variety of contexts

• **Immediate submission** of responses
  
  1. With a range of devices
  2. Anonymously or identified

• **Responses viewed** as a range of graph types

• **Reporting** on collected data is possible
Caveat

Bell (1998) argues that,

"The MCQ format holds world records in the categories of most popular, most unpopular, most used, most misused, most loved, and most hated"
Why use EVS? (Bruff, 2009)

• Increases student attendance, participation and enjoyment

• Provides both teachers and learners useful feedback on student learning

"Teaching methods that use active learning, such as small-group and classwide discussion methods, typically result in improve learning over methods in which students play more passive roles." (p. 5)
Why use EVS?

Gives prompt feedback (Chickering & Gamson, 1987)

RATIONALE
Diagnostic testing to support formative assessment
Why use EVS?

Helps clarify what good performance is (goals, criteria, expected standards) (Nicol & Macfarlane-Dick, 2006)

<table>
<thead>
<tr>
<th>ICE 2009/1</th>
<th>Revision lecture</th>
</tr>
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<tbody>
<tr>
<td>Question 4</td>
<td></td>
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**What is the 5th out of 7 steps in a catalytic reaction?**

1. External diffusion
2. Adsorption
3. Internal diffusion
4. **Desorption**

**RATIONALE**

End of semester revision quiz with an included competitive element
Why use EVS?

RATIONALE
Provides information to teachers that can be used to help shape teaching. (Nicol & Macfarlane Dick, 2006)
Some considerations (Bruff, 2009)

- What **student learning goals** do I have for the question?
- What do I **hope to learn** about my students by asking this question?
- What will **my students learn** about each other when they see the results of this question?
- How might this question be used to **engage students with course content** in small-group or classwide discussions?
- What **distribution of responses** do I expect to see from my students?
- What might I do if the actual distribution **turns out very differently**?
Assertion reason questions

• Assertion reason questions (ARQs) are developed from MCQs.

• Aim to develop a question set which would **test reasoning** (procedural knowledge) **rather than recall** (declarative knowledge).

• ARQs will test two per question (the assertion and reason statements) as well as the validity of the 'because' statement.
Is grass green?

a. Yes, because it contains a pigment known as chlorophyll
b. Yes, because it excretes a gas known as ammonia
c. No, because it is red in colour and then dyed green
d. No, because the effects of oxidation means that the colour is blue
Mazur's Peer Instruction Sequence

1. Concept question posed
2. Individual Thinking: students given time to think individually
3. Students provide individual responses
4. Students receive feedback (as a histogram)
5. Small group discussion
6. Retesting of same concept
7. Students provide individual responses
8. Students receive feedback – as a histogram
9. Lecturer summarises and explains "correct" response(s)
Chalk, Talk, Digital Pens and Audience Response Systems

Combining tradition and technology to improve maths learning

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I. Aim
To enhance maths learning by facilitating student interaction and peer instruction in problem classes using Turning Point™ audience response systems—"clickers"—and PaperShow™ digital "optical" pen.

II. Interactive problem classes: combined Mazur/Dufresne sequences involving peer instruction
(1) Set question + 5 mins. of individual work
(2) Click answer
(3) Discuss answer with other students
(4) Re-click answer
(5) Paper-show and chalk and talk right answer

III. Click (2) answer, The ratio test shows that the series

IV. re-click (4) answer, The ratio test shows that the series

VII. Student feedback
Questionnaire results
31 responses from approx. 40 students attending problem classes

VIII. Word cloud (©) from students' written feedback

"I think the optical pen is a useful tool for interactive learning and its use improved my learning experience."

Strongly agree: 14, Agree: 5, Neutral: 1, Disagree: 1, Strongly disagree: 1, Other: 0

65%

"I think clickers are a useful tool for interactive learning and their use improved my learning experience."

Strongly agree: 10, Agree: 8, Neutral: 1, Disagree: 1, Strongly disagree: 1, Other: 1

77%

More information on these and other Classroom Technologies can be found at the blog http://go.bath.ac.uk/ct;
Image captured using Panopto™;
Questionnaire designed, delivered and analysed via Google™ Forms;
Word cloud produced via www.wordle.net: the word size within the cloud is proportional to its frequency within the processed text.
Enhancing feedback

The manager of an autonomous system in the Internet

A. Can do whatever he likes
B. Must implement the routing policy of whoever his AS is connected to
C. Must satisfy the constraints of whoever his AS is connected to
D. Depends on whether it's stub/transit

A. True, but he may not stay connected to the Internet for very long.
B. It would be rare to be told what routing policy to implement.
C. Yes, such constraints must be satisfied.
D. In theory no, but in practice a transit AS will have many more constraints.

Fig. 4. A question with no right answer (Session 1, slides 17–18)
Davenport, Hayes & Parmar (2009)
Technologies

- Ombea
- TurningPoint

- Poll Everywhere, polleverywhere.com (free for up 40 users)
- Kahoot!, getkahoot.com (game-based response system)
Questions?
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References


