Electronic Voting Systems
or
Response Systems

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N.B.

- I am not trying to convince you to do something you don’t want to – I have enough to do as it is!
- If you are interested in using this technology talk to me afterwards and we can talk about support
- If several of you are interested we can talk about sharing resources and combined evaluation

Health warning

- I consider this technology to be
  - fairly stable
  - supported by the university
  - in use elsewhere (including in mathematical sciences)

Outline

- What is it?
- The theory
- Use elsewhere
- Advantages and disadvantages
- Demo

What is it?

Terminology issues

an

- Electronic Voting System
- Audience Response System
- Personal Response System
- Group Response System
- Student Response System
- Classroom Communication System

uses

- handsets
- controllers
- clickers

to allow “votes” or “responses” to be collected

Advances in technology

- McCabe (2003) reports the technology for doing this used to be “clunky” but in “recent years” the hardware and software have improved to become “adequate for the task” (p. 24).
- Nottingham owns TurningPoint kit

What is it?

- Students get handset with buttons 0-9
- TurningPoint software integrates with PowerPoint (only), displays questions and collects responses
- Shows chart of responses

In theory

Lectures

- Effective form of teaching
- But one-way content transmission, encourage passivity, disengagement from audience
- Printed notes further discourages processing/cognition
- Student motivation at university

Engagement

- Asking the audience a question makes a few students engage with material and prepare an answer
- But most do not
- Theory is that a Response System causes each student to engage and come to an answer
- This causes attachment with material, improves learning

Feedback (to student)

- Also each student gets personal feedback
- Since they know which answer they chose they know whether their answer is correct and get feedback if incorrect
- They feel a personal connection
- (even hundreds at a time)

Feedback (to lecturer)

- Lecturers “had their own assumptions challenged when a supposedly easy question or concept was not understood by large numbers of the class, revealing a different conceptual model of the topic" Simpson & Oliver (2007)

Use in UK HE

List in 2008 (self declared likely incomplete) has:

- Aberdeen
- Abertay
- Bangor
- Bath (mech eng)
- Bournemouth
- Brighton (business, soc sci)
- Bristol
- City
- Coventry
- Durham (**maths - James Blowey,** geol)
- Edinburgh (phys, biol)
- Essex (sport)
- Galway (marketing)
- Glasgow (**stats**, phys, CS, biol, med, vet, dental, phil, psych, lang, edu)
- Glasgow Caledonian (business)
- Hertfordshire
- Keele
- Kings College, London (bio)
- Kingston (business)
- Lancaster (econ, accounting & finance)
- Leeds
- Leicester (biol, schools outreach, renaissance studies)
- Liverpool (mech eng)
- Liverpool John Moores (bio, geology)

Use in UK HE

- Loughborough (**maths - Carol Robinson**)
- Newcastle
- Northumbria (humanities)
- Nottingham (genetics - Liz Sockett)
- Portsmouth (**maths – Michael McCabe**, psych)
- Queen Margaret
- Queen's, Belfast
- Reading (chem)
- Robert Gordon (computing- **Garry Brindley**, health, social care)
- Roehampton
- Salford (eng)
- Science Museum (London) (public engagement)
- Southampton (**maths – Ray d'Inverno**, elec, CS, schools outreach)
- St. George's, London (med)
- Strathclyde (mech eng, **maths - Geoff McKay**, psych, lang, student induction)
- Surrey (biol)
- UCE
- UCL
- UCLAN (sports)
- UEA (med)
- Ulster (eng)
- Wales, College of Medicine (medicine, phys, school liaison)
- Warwick (library, med)
- Wolverhampton (computing)

Advantages over other methods (show of hands, etc.)

- Anonymity
  - Privacy
  - Lack of peer pressure
  - Lack of fear of embarrassment
- Comprehensiveness
  - one student, one vote

Possible advantages

- More likely to answer (honestly)
  (e.g. Students able to “focus on areas of weakness without exposing these to the group" Halloran, 1995)
- More likely to attend
  (e.g. Wit, 2003, reports attendance for tutorial weeks 5-8 of 10 up from 10% in previous years to 40% in the 2 years when the voting technology was used)

Possible disadvantages of EVS

- Relies on MCQs
- Distracting technology (for lecturer and student)

Novelty / distraction

- Halloran (1995) felt a novelty effect but that the students were more able to focus on the content as they became “more familiar or desensitized” to the technology (p. 287).

Passivity

- “It is possible that interactive teaching will not automatically result in active cognitive experience” (Simpson & Oliver, 2007)
- But **the chances are** that more students will be mentally engaged when involved in learning activities like reading, writing, discussion and problem-solving (Van Dijk, et al, 2001; p. 25).

Disadvantages of TurningPoint

- PowerPoint
- Relatively inflexible (retaking questions, adding new questions, “branching”)
- Some systems have short message entry, multiple response

Does it work?

- “Majority [of students] appear in favour of these systems and perceive that their use is of benefit to their learning. Most of these evaluations are based on self report of perceptions and qualitative methodologies rather than the impact on learning itself.” (Simpson & Oliver, 2007)

- d’Inverno (2003) found that “use of the system polarized the class into those in favour of its use (‘an exciting new development’) and those against (‘stop messing around with technology and get back to good basic teaching’)” (p. 19).

- A couple of studies show little impact on results or retention
- However, these seem to involve superficial use

- “the potential of these systems depends on the skills and approach taken by teachers”
- "Voting systems provide fast feedback; if staff are to respond, they cannot be wedded to scripted and planned lectures.“
- Simpson & Oliver (2007)

Some methods thought to work

- Involve cognition
- Not just asking questions for the sake of it

“Dual questions”

1a) What is the definition of this concept?
b) What concept is defined by this definition?
2a) Which of these statements are correct about this plot?
b) Which of these plots can you associate with the following statement?
3a) Which of these analysis methods is useful for this data?
b) Which of these datasets could be analysed by this method?
4a) Which of the following interpretations corresponds to this output?
b) Which of the following outputs warrants the following interpretation?
Taken from Wit, 2003.

“Dual questions”

- “Testing the different directions of the link between the general and the particular is not only important in itself because understanding requires understanding all of these, but it also keeps the type of mental demand on the students fresh, even if one is in fact sticking to the same topic.” (Wit, 2003).

Peer discussion

- Two rounds of voting with discussion

50:50

- Witt (2003) used two rounds of voting but used a "50:50 technique" in which all but 2 possible answers were eliminated after the first round. "this gave me the chance to address two separate issues in two separate instances" (p. 18).

Is it worth it?

- There are disadvantages to using the technology but these are often seen to be outweighed by the benefits (e.g. 87% of students of Witt; N.B. of *attending* students).

- "Throughout the literature reviewed, there appears to be consensus that [response systems] do not 'cause' good learning; however when used as part of a wider effort to support active engagement with learning there is evidence that they can support increased motivation and attainment, at least in part as a result of their ability to provide rapid feedback on the learning process."
  Simpson & Oliver (2007)

References

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