The carrot without the stick: A case study of encouraging post-event student engagement with mobile phone technologies

George P. Banky
Swinburne University of Technology, Melbourne, Australia
gbanky@swin.edu.au

Abstract: The difficulty of successfully engaging students to participate in their learning at tertiary institutions has been identified by researchers as a major concern. In particular, post-event learner engagement with lecture material is virtually non-existent. In this sequential study over two semesters, students, who were enrolled into a first-year undergraduate subject, were asked to submit electronically, before the commencement of the next lecture, answers to a question that either related to or extended the content of the previous lecture. In order to encourage their level of post-event engagement, during one of the semesters, at the start of each of their lectures not only were the previously posed questions discussed, but the students were first asked to vote, using their mobile phones, on the correct answer from a choice of alternatives. The effect of this intervention was gauged from participants' perceptions and triangulated with each cohort's online submission rates. The results indicated that while their online submission rates did not improve significantly, the students did perceive that participating in the voting process encouraged them to investigate the set questions in their own time.

Introduction

Researchers have described good teaching as a conversation (Laurillard, 1993; Ramsden, 2003) or as an interactive engagement with the students (Chickering & Gamson, 1987; Lizzio, Wilson, & Simons, 2002; Newlin & Wang, 2002). The exposure to different learning/teaching strategies and techniques for students transitioning into tertiary courses has been identified as particularly important (Britain, 2004). Therefore, there are clear benefits from researching the introduction of novel interventions into subjects, which are in the early years of undergraduate courses.

Student engagement is the 'holy grail' for educators, and enabling the learners to take "responsibility for self-regulation in the learning process is a value that universities aim to encourage among their first year cohort." (James, Krause, & Jennings, 2010:43). The identified enabler for both of these outcomes is engagement by the learner. It is interesting to note that disengagement is an equally instructive metric. Students have identified one indicator for disengagement as "coming to class without completing readings or assignments" (Krause, Hartley, James, & McInnis, 2005:38).

The students who are presently entering tertiary courses have been exposed to a diverse range of digital technologies, yet very few of them are frequent users of the complete range of available features (Kennedy, et al., 2007). This must affect their skills and learning preferences and cause for many of them an expectation of having such devices an integral part of any practiced pedagogy. The findings that "the vast majority of students use a mobile phone … to make calls and to send text messages" (Kennedy, et al., 2007:520) affirms the exploration of these activities for student engagement.

Findings of one research study conducted over fifteen years asserted that students who were enrolled in Australian universities, were spending less and less time in private study outside of class in the critical first-year of their courses (James, et al., 2010). For an increasing number their priority appears

to be paid work hence the need exists for innovative techniques that could elevate post-event engagement higher up in their 'to-do' lists.

'Electronic Voting Systems' have "been identified as a potential solution to the need for interactivity and for timely and appropriate feedback and they will work in a large group situation" (Felce, 2007:12). In fact, an Internet-based system, *VotApedia Audience Response* (http://www.urvoting.com/), has been "used to facilitate interaction in the face-to-face lectures … for … managing student expectations, clearing up common misconceptions and developing student understanding of key concepts" (Maier, 2009:46). In the case study reported here this system was used to encourage out-of-class student engagement.

Details of the case study

In 2010 a mobile phone-based intervention was introduced into the lectures of a first-year subject dealing with electronic circuit behaviour, which was taught into some engineering degree courses offered at Swinburne University of Technology. For the previous two years, in order to encourage engagement by the cohort, at the end of each lecture, the lecturer would ask the students to think about a question, called a "Conceptual Hurdle", which was based on the material presented during this subject's lecture. The answer to it was to be submitted online via the University's learning management system, Blackboard (http://www.blackboard.com), and then discussed in detail at the start of the next session.

For ten "conceptual hurdles", which were presented during the first four weeks of the semester, prior to any discussion, the students were asked to indicate their solutions by selecting the correct answer from a multiple-choice list displayed in the lecture theatre. The students' inputs were obtained by them making a charge-free mobile telephone call to a phone number that was uniquely associated with each option. This service, which also calculated and displayed the response percentages, was provided by *VotApedia*. A typical survey page is shown in Figure 1.
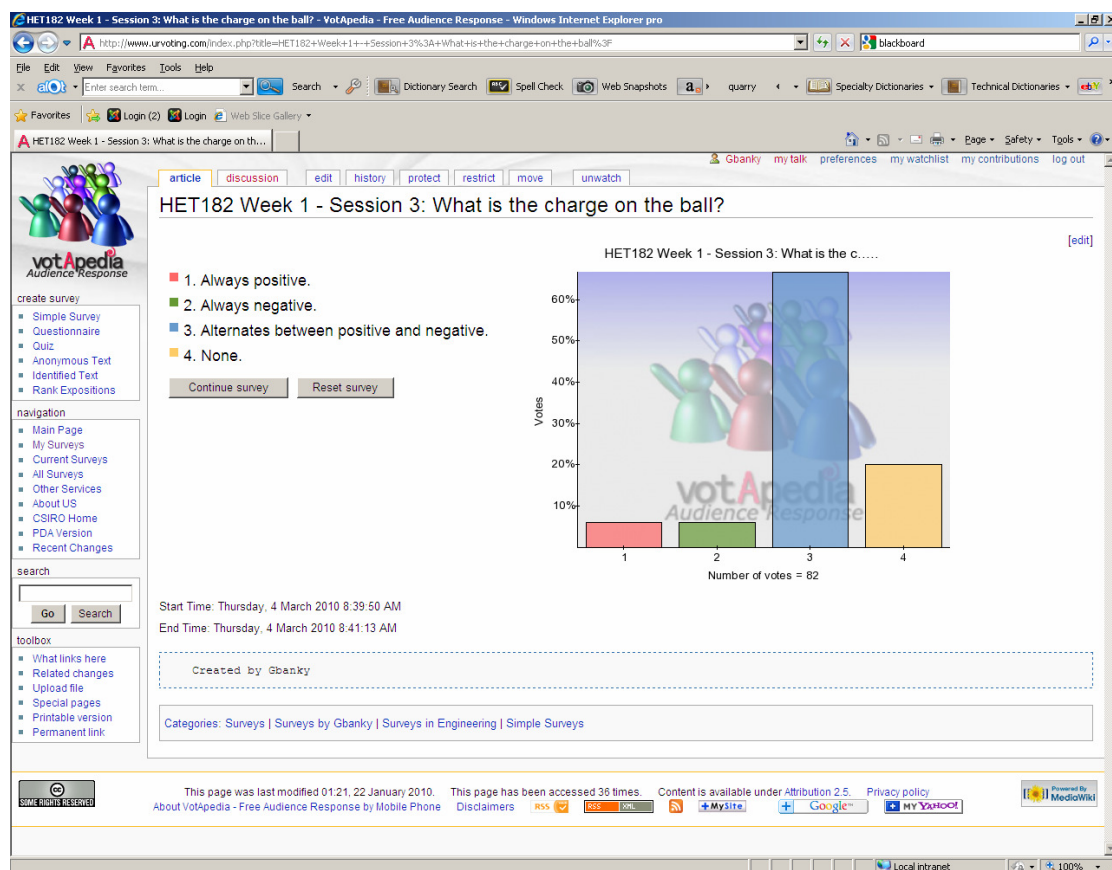

Figure 1: Typical Votapedia survey page for a "conceptual hurdle"

Method

Mobile phones were selected as the response devices for the students after considering both the disadvantages of the alternatives and the benefits of *Votapedia* as detailed by Maier (2009). Furthermore, in this context the use of mobile phones have the advantages of:

- Requiring no training of the user;
- No need for distribution to and then collection from the participants;
- Ubiquitous availability within the student community.

The choice of data collection techniques was restricted by the fundamental requirement that this should not encroach on the allocated lecture time. At the conclusion of the intervention the students were asked to use *Votapedia* to indicate on a 5-point Likert-scale their response to a survey question. Rather than using an online- or paper-based survey, this was an attempt to confine the respondents to those who may have participated in previous votes. This data was triangulated by collating the online submission rates from the cohorts who were and were not exposed to the intervention. The linkage between the resultant data sets is the hypothesis that in order to answer a question, even anonymously, a person would be prompted to investigate the problem hence engage with the material.

Results

As seen in Table 1, participant responses to the post-event survey conducted in the fifth academic week using *Votapedia* show that only 19.5% of the respondents disagreed with the statement that the prospect of voting for the correct solution encouraged them to attempt the previously set tasks.

Table 1: Participants' perception of the intervention

Post-event Survey Question: (N=87)	SA	A	N	D	SD
Participating in *VotApedia* encouraged me to attempt the "Conceptual Hurdles"	20.7%	43.7%	16.1%	10.3%	9.2%

A visual inspection of Figure 2 showing the online submission rates for 2009 (cohort size of 139) and 2010 (cohort size of 177) confirms that the trending of the obtained data sets has been unaffected by the intervention. Further, the characteristic drop in student participation as the semester progresses is clearly visible for both data sets.

Discussion

The participants' perceptions of the intervention are not supported by the online submission rates. There appears to be little difference between the rates for 2009 (no intervention) and 2010 (intervention introduced). This may be explained by issues with the attempted triangulation, some of these being:

- The students who posted online may or may not have voted in, or even attended the next lecture;
- Not all the students had mobile phones, while all of them had access to upload a submission;
- Skipping lectures, which signals 'lack of engagement' (James, et al., 2010), has been ignored since no attendance records were kept;
- The size of the student cohort was based on the numbers that attempted the subject and used to calculate the percentages in Figure 2, could have skewed the resultant data.

On the other hand, the apparent enthusiasm of the participants towards the intervention, as detailed in Table 1, may be explained by what has been identified by others as the:

- 'Novelty Effect' - attributed to the simple fact that the participants may be engaged in something new and different; or the
- 'John Henry Effect' - attributed to the participants' subconscious threat of possible failure inciting them to perform better than what would normally be expected (Phipps & Merisotis, 1999); or the
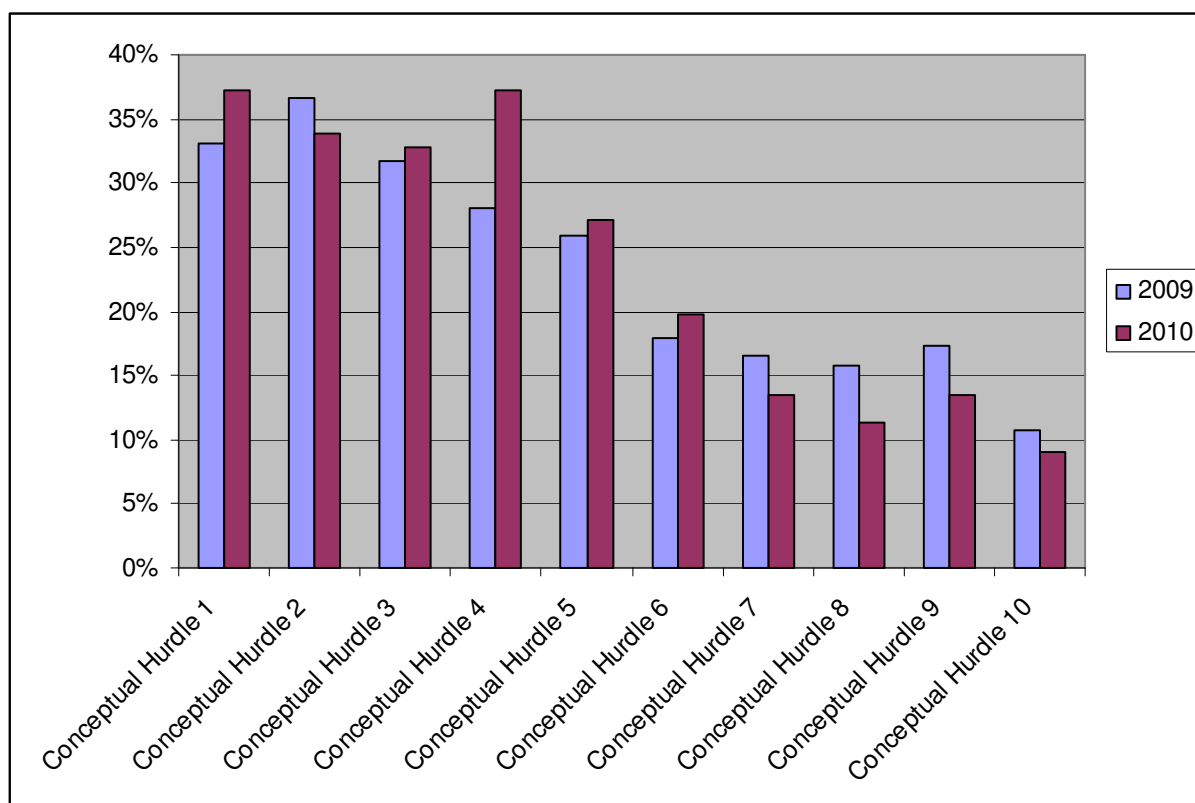
Figure 2: Histogram showing percentage of enrolled students who responded online without (2009) and with the opportunity to also vote on the correct solution (2010)

- 'Hawthorne Effect' - proposed following the analysis of staff motivation studies completed between 1924 and 1927 at the Western Electric Hawthorne Works in Chicago, IL., where some of the experimental outcomes were found to have been influenced by the fact that the participants felt privileged by the knowledge of being part of a research exercise (Adair, 1984).

In reality, irrespective of which of the above three effects caused the results in Table 1, the important outcome is that there were a number of participating students who perceived the intervention positively. It is important to note that since it is impossible to influence all participants with an intervention, the fact that there were some who felt a benefit made this exercise worthwhile.

Conclusions and Recommendations

The obtained data has not provided conclusive evidence that the introduction of electronic voting by the students encouraged their post-event engagement with the lecture material. Better data collection techniques are required for a clearer picture. Two issues raised by the results, namely the equity of access to mobile phones and the significant drop in the number of participating students after hurdle number four, need further investigation.

However, since students tend to learn in many different ways (Kolb, 1976), it is imperative that teachers, at all times, try different teaching techniques in an attempt to match their students' learning styles. Therefore even if a few participants were affected positively by this intervention, the integration of an 'Electronic Voting System' into any face-to-face delivery is highly recommended – particularly with *VotApedia* which is very easy to setup and use.

References

Britain, S. (2004). *Review of Learning Design: Concept, Specifications and Tools*. London, UK: The Joint Information Systems Committee.

Chickering, A. W., & Gamson, Z. F. (1987). *Seven Principles of Good Practice in Undergraduate Education: Faculty Inventory*. Racine, WI: The Johnson Foundation, Inc.

Felce, A. (2007). A critical analysis of the use of electronic voting systems: Ask the audience. *Emirates Journal for Engineering Research, 12*(1), 11-26.

James, R., Krause, K.-L., & Jennings, C. (2010). *The First Year Experience in Australian Universities: Findings from 1994 to 2009*. Parkville, Vic.: University of Melbourne.

Kennedy, G., Dalgarno, B., Gray, K., Judd, T., Waycott, J., Bennett, S., et al. (2007, December 2 - 5, 2007). *The net generation are not big users of Web 2.0 technologies: Preliminary Findings*. Paper presented at the ascilite Singapore 2007, Singapore.

Kolb, D. A. (1976). *The Learning Style Inventory: Technical Manual*. Boston, MA: McBer & Company.

Krause, K.-L., Hartley, R., James, R., & McInnis, C. (2005). *The First Year Experience in Australian Universities: Findings from a Decade of National Studies*. Canberra, ACT: Department of Education, Science and Training.

Laurillard, D. (1993). *Rethinking University Teaching - a framework for the effective use of educational technology*. London, UK: Routledge.

Lizzio, A., Wilson, K., & Simons, R. (2002). University Students' Perceptions of the Learning Environment and Academic Outcomes: implications for theory and practice. *Studies in Higher Education, 27*(1), 27-52.

Maier, H. R. (2009, December 6 - 9, 2009). *Student participation in lectures using mobile phones*. Paper presented at the 20th Annual Conference for the Australasian Association for Engineering Education, Adelaide, S.A.

Newlin, M. H., & Wang, A. Y. (2002). Integrating Technology and Pedagogy: Web Instruction and Seven Principles Undergraduate Education. *Teaching in Psychology, 29*(4).

Ramsden, P. (2003). *Learning to Teach in Higher Education* (2nd. ed.). London, UK: RoutledgeFalmer.

Acknowledgement