

## **Report on the Personal Response System (PRS)**

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### **Background**

This system was first seen in action by the author of this report in 2001 at an ALT-C seminar on the development of multimedia for web use at Oxford Brookes. The Media Development Centre team from Portsmouth University demonstrated the software somewhat as an aside to their main task but they did allude to the teaching and learning benefits from this system.

Upon returning to Northumbria and discussing the possibilities of this system with the Teaching and Learning Coordinators some additional research was carried out. Further discussions were held with Media Development Centre team at Portsmouth University, with Professor Jim Boyle at Strathclyde University and Dr Caroline Elliot at Lancaster University, an LTSN prize winner. These were all successfully using PRS in Higher Education teaching. There were also discussions with the West Midlands Perinatal Institute in Birmingham who was using a similar system for collecting research data from health practitioners.

Other desk research showed that there were other large users of PRS in Hong Kong and the United States of America. The view among existing users was that this system provided a number of teaching and learning benefits, including

- Interactive engagement with learners
- More motivated and confident participants
- Useful for peer discussion
- Tests and reinforces learning
- A positive effect on multiple choice style examinations
- Collects data for feedback
- It's good fun!

### **Alternative systems**

An investigation into alternative systems was carried out, e.g. XTOL, TI-Navigator. These are wireless based systems whereas the PRS involves classroom participants pointing an infrared transmitting button at a receiver. It was clear that the PRS was considerably cheaper than its rivals. With this information the TLA coordinators decided to pilot a system. A single PRS receiver and 80 transmitting buttons were purchased.

### **The Pilot**

Two of the LTA coordinators, Arts and Social Sciences, piloted the system for use with large classes in lecture theatres during both semesters of academic year 2001 - 2002.

Most of the activities involved multiple choice style questions and student feedback as to the usefulness of the PRS was generally excellent. Some use was made of it as a feedback mechanism on the teaching and learning in the session. Data could be analysed following the lecture and appropriate adjustments could be made for the following session. The system was also used to run an experiment in which students would be able to critically analyse the nature of rationality in economics. This was run twice and was very successful.

Workshops were also run for staff in Social Sciences and at Carlisle Campus and it was made available at the Northumbria Conference. Some staff saw more opportunities in using it than others, particularly those whose subjects more disposed to multiple choice style questions. However, it is safe to say that a number of staff thought this would be a useful teaching and learning tool for large and small group sessions.

A visit to the Mechanical Engineering department at Strathclyde University was also undertaken to see PRS in action elsewhere. The Mechanical Engineering Department, under the direction of Professor Jim Boyle, is at the fore of combining traditional and modern information technologies in classrooms that are radically different in design to that used in Northumbria University. The PRS is only part of a managed learning environment. Lectures are 2 hours long with a break in between. Students sit in fours at concaved shaped desks in a gently sloping lecture theatre. Students collect their own PRS button at the start of the class. Questions are integrated into the lecture. Students are asked to respond either as individuals or in groups. There is relevant discussion and students seem to be motivated and engaged during the 2 hour slot. Jim Boyle noted that pedagogy underpinned the introduction of PRS and other developments and that the result was a dramatic improvement in pass rates.

### **Further Advantages**

In addition to the advantages outlined above there were a number of other benefits from this system. In general participants commented on how the technology help them engage with the lecturer and with their peers. They did not have to constantly write down lecture notes. Critics have suggested that the same results could be achieved by a show of hands. However, such a simple method has a number of drawbacks: students may only raise their hand because others have done so; there maybe multiple votes and some may not vote at all. The 'show of hands' system is thus unlikely to be a good test of learning. The PRS can be set to either an 'anonymous' or 'known' mode so that the lecturer can either allow students to assess their own learning or keep track of how each is doing. It can be used therefore to test learning in a non-embarrassing way for the student or it could be used to undertake summative assessments over the semester (as data is easily transferable into Excel). Finally, everyone I spoke to said that the number of thefts/loss of buttons was not an issue.

In sum it is a flexible system that be used to undertake a variety of tasks including multiple choice questions, feedback on teaching and learning, running experiments, collecting data for research.

### **Issues**

Some challenges are presented by this technology. First, in each hour long session that the PRS was used during the pilot it took 15 to 20 minutes to set up and put away and required the help of learning resources. Second, retaining a portable system would require a closer examination of possible health and safety issues such as additional wires as well as ensuring that the software could be integrated with the NT Platform. There were some conflicts with the NT platform but it was possible to use the PRS on Windows 98. Third, there was a software issue. The (visual basic) software generally worked well with Windows but the version tested did not allow diagrams to be presented. Thus, multiple choice questions that may necessitate reference to a diagram require the lecturer to use an OHP (though some interchange between the PRS software and say PowerPoint was feasible it became somewhat of a distraction for students). A new (Java-based) version of the software is available apparently but I have yet to see it.

Finally, in using the PRS the lecturer will have to rethink their teaching and learning strategy for each session. One possible strategy is to divide the lecture into three 10 to 15 minute slots and discuss the key issues. The PRS could then be employed along the way to collect data (say about prior normative positions in relation to an issue), run an experiment, and re-test the position of participants at the end of the session. Alternatively, lecturers might use to test learning of each issue. However, in using PRS lecturers may have to make up for the time lost through setting up etc. by directed reading or additional notes.

### **Recommendations**

As demonstrated there are significant advantages in purchasing the PRS. The portable system worked well but there were some possible health and safety issues associated with it. It also requires the use of a portable computer and that might be an additional cost.

However, a number of portable systems should be purchased. More permanent systems would be beneficial but only for some people at this stage. A longer term learning resource strategy that examined the nature of the teaching space and considered the development of appropriate teaching and learning technologies would be an important development.

#### **Some useful web addresses**

<http://www.mecheng.strath.ac.uk/natalie.asp#>

<http://www.strath.ac.uk/Departments/CAP/courses/interactive/powerpoint/sld001.htm>

<http://www.ust.hk/celt/ideas/prs/>

[http://www.hku.hk/caut/scholar/abstracts/037\\_snider.htm](http://www.hku.hk/caut/scholar/abstracts/037_snider.htm)

[http://www.economics.ltsn.ac.uk/showcase/elliott\\_prs.htm](http://www.economics.ltsn.ac.uk/showcase/elliott_prs.htm)