The use of personal response systems in lectures can increase students’ understanding and enable lecturers to gather instant feedback

Improving learning with personal response systems

In this article...

- How a personal response system can aid learning for nursing and midwifery students
- Limitations of PRS use
- Suggestions for future research into PRS

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Abstract

Aim
The aim of this evaluation research is to establish whether the use of the personal response system (PRS) teaching tool enhances education in nursing and midwifery lectures.

Methods
The research was based on findings from an online questionnaire, lesson observation and staff interviews.

Results
Of the 91 respondents, 95% found the PRS added interest to lectures, 78% found that it generated group discussion, 90% said it improved their understanding, 93% enjoyed using the system and 93% would like to use it again in their learning.

Conclusions
Literature and evidence conclusively states that the use of PRS increases understanding. It also highlights that greater preparation by teaching staff is required and extra delivery time needed when using this teaching tool.

In 2008, the Faculty of Health at Robert Gordon University (RGU) purchased a personal response system (PRS) for use in lectures. To use the system, the lecturer connects a USB receiver to a computer and each student is given a handset featuring alphanumeric and “true or false” buttons. The PRS works with Microsoft PowerPoint and allows students’ responses to questions to be displayed automatically in a graph (Clark, 2008).

The PRS was used in the large lecture theatre at the Faculty of Health building at Garthdee in Aberdeen. This custom-built room holds 200 students and is equipped with audiovisual equipment, making it the perfect environment in which to use a PRS.

After using the PRS for around a year, the faculty requested an evaluation be carried out. This evaluation is the driver behind this study.

Literature review
While there are numerous articles and studies looking at the use of voting systems in education, research on their use in nursing and midwifery programmes is limited. In addition, there appear to be very few studies reporting negative experiences with these systems.

Basic usage
Many studies have looked at using a PRS as a tool to increase interaction and engagement in traditional lecture settings where participation and student concentration levels tend to be low. They have shown the advantage of the lecturer being able to use questions to check students’ understanding before progressing through the subject.

Novelty value
Stowell and Nelson (2007) compared the use of a PRS with students voting by raising cards and voting by a show of hands. The use of card voting led to greater participation than raising a hand. They concluded that using any prop in teaching leads to commitment, an expectation of involvement and gives the lecture a novelty factor.
Anonymity
With an anonymous vote, students are free to put forward their true thoughts without fear of identification and embarrassment. The results can be collated for assessment but, in this case, the votes were cast anonymously.

Banks (2006) found that anonymous voting encouraged shy students to contribute to class and Tucker et al (2010) noted that the option of anonymous voting is helpful when looking at sensitive subjects such as sexuality.

Question types
One characteristic of a PRS that might deter teaching staff from using it, especially in higher education, is its reliance on multiple-choice questions (Ventouras et al, 2010); these allow struggling students to guess answers and may also fuel debates about the “dumbing down” of education in the media (Gill, 2008). Bloom’s taxonomy (1956), as cited by Atherton (2009), suggests this level of knowledge assessment should only be used for recall and does not assess true understanding.

Academic performance
Miller et al (2003) reported that although the PRS was evaluated well and appreciated by healthcare students, there was little or no difference between the performance of one group using the system and a control group who did not. This is one of the few studies to measure academic performance after the session that also used a control group for comparison.

Method
The fundamental aim of the evaluation was to find out how the PRS affects the quality of education. A recent course redesign meant direct comparison of assessment grades would not be possible so students were asked for their opinions via an online survey, as this could capture a large number of responses. The opinions of staff using the PRS were obtained through qualitative interviews and first-hand observation of what happens when the PRS is used in lectures.

Results
Student online survey
Once the data had been collected from the student survey, it was immediately clear the PRS had made a positive impact (Table 1). There were 91 responses to the survey and in every category the students gave positive feedback. Most selected “agree” or “strongly agree” when asked if the PRS provided interest and enjoyment at the lecture. This result matches almost exactly the outcomes noted by Latessa and Mouw (2005). When asked about the enhancement of their understanding, 90% (82) of respondents stated that using a PRS had been a positive experience in this respect (Fig 1).

Traditional lecture: PRS allows anonymity, which encourages shy students to contribute

Lecture observation
Some inexperienced staff initially struggled with using the system and one needed encouragement from students during a lecture I observed. While this looked to me like a bad learning experience for the students, the effectiveness of the PRS won them over and the lecturer received a round of applause at the end of the presentation. This was noted as a genuine and spontaneous sign of appreciation from the students.

Staff interviews
Interviews with nursing lecturers on the use of a PRS have been largely positive, particularly around the ability to collect large amounts of digital data, which was described as “very efficient”. However, a common criticism was the amount of time it took to set the system up and to discuss the findings of each interactive question. Presentations had to be redesigned to accommodate thePRS questions.

One adult nursing lecturer noted that the PRS allowed the discussion to be adjusted to “suit the needs of the learner”, showing that the instant feedback provided to the lecturer by the PRS is particularly useful.

Discussion
Using the PRS for feedback gives lecturers the opportunity to collect large amounts

<p>| TABLE 1. STUDENT FEEDBACK ON THE PRS |</p>
<table>
<thead>
<tr>
<th>Question</th>
<th>Question text</th>
<th>Positive responses (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The personal response system provided additional interest to the lecture</td>
<td>95</td>
</tr>
<tr>
<td>2</td>
<td>The interactive vote prompted group discussion</td>
<td>78</td>
</tr>
<tr>
<td>3</td>
<td>The interactive vote enhanced your understanding</td>
<td>90</td>
</tr>
<tr>
<td>4</td>
<td>The voting questions were easy to understand</td>
<td>95</td>
</tr>
<tr>
<td>5</td>
<td>The time allowed for each question was sufficient</td>
<td>84</td>
</tr>
<tr>
<td>6</td>
<td>The handset was easy to use</td>
<td>95</td>
</tr>
<tr>
<td>7</td>
<td>You enjoyed using the personal response system</td>
<td>93</td>
</tr>
<tr>
<td>8</td>
<td>You would like to use the system again</td>
<td>93</td>
</tr>
</tbody>
</table>
of data digitally. This gives reassurance to students and allows academic staff to check student knowledge before they go to clinical placement, for example.

The main finding of this study (reinforced by other studies) seems to be that the student audience enjoys using the PRS. The majority of students in this study also believe its use enhances their education, which could be the focus of future studies.

Clearly there are hardware limitations since the faculty has only 300 handsets, so currently these are only loaned out to students. As there are only six receivers, only six concurrent sessions can use the equipment.

The PRS has not been exploited fully at this faculty; for example, other question types such as short answer or numerical questions could be used in drug calculation exercises. This could be done at a loss of preparation time as noted by Kay and LeSage [2009]. The equipment is used by a small minority of teaching staff at the faculty and the ability to store, report and analyse student responses is underused, with most users opting to use anonymous polls only. From the online survey, 95% of students reported that the handsets are easy to use.

As can be seen in the graph of responses (Fig 1), all questions revealed the students reported that the handsets are easy to use. From the online survey, 95% of students found the system easy to use and felt it enhanced their education. The majority of students in this study also believe its use enhances their education, which could be the focus of future studies.

This result is similar to Latessa and Mouw’s study [2005], which also found the majority of the people they asked found the system easy to use and felt it enhanced their education.

Critics of the PRS, such as Ventouras et al [2010], may dislike the question types and doubt the system’s ability to improve academic grades [Miller et al, 2003]. However, given the positive feedback in this study, I believe that further studies of groups of young undergraduate students may find increased academic performance.

The study has uncovered a desire in both academic staff and students to use the PRS more often. Taking on board the experiences of Walgren [2011], this could be in the form of different question types – perhaps for drug calculation exercises – or group work activities.

Future studies may choose to examine the sample population in more detail, looking at age, gender and grades. With additional data giving more detail on demographics, further analysis could be carried out to show the reasons behind the responses and steps could then be taken to improve the use of the PRS in teaching. In addition, further study might also choose to look at more than one institution for a wider understanding.

**Conclusion**

This research confirms the findings of similar studies in to the PRS and gives an evaluation of its use in a nursing and midwifery context. While the study highlights that using the system means teaching staff need more time to prepare for lectures, the literature and evidence found conclusively that the PRS enhances educational understanding. NT

**References**

Atherton J [2009] Learning and Teaching: Bloom’s Taxonomy; tinyurl.com/yh7qm3y


