Chapter V

Practical Lessons from Four Years of Using an ARS in Every Lecture of a Large Class

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Abstract

This chapter explores pedagogical and logistical issues arising from the extension, using an audience response system (ARS), of an existing module based on traditional 1-hour lectures, over a period of 4 years. The principal issues involve the limited time for equipment setup; the significant time taken to present each ARS question, and hence, the need to maximise the learning gain from each question asked; the importance of considering the pedagogical rationale for using the ARS; the complexity of remediation and the acknowledgement that not all student misunderstandings highlighted by the ARS can be addressed effectively within the lecture. The chapter offers suggestions on the following aspects of ARS use: the setting up in theatres, and distribution to students of ARS equipment; a range of pedagogical rationales underpinning question design; guidelines on session format and question structure; remediation issues both within and outside the lecture context.
Introduction

The adoption of new technology in teaching and learning, as in other settings, often follows a trial-and-error path as the early adopters attempt to discover effective methodologies for use. This often discourages early widespread take-up of new technology. Attempts to rollout audience response systems across the University of Glasgow, while being relatively successful, have highlighted this blockage to take-up. Using an ARS for the first few times is problematic, since the adopters are lecturers who typically (a) have little spare time, (b) do not want to contemplate “failure” in front of their classes, and (c) have no personal experience of this technology from their own education. Successful adoptions at Glasgow have come partially from our being able to pass on the growing personal experience of the brave, early adopters to other interested individuals. Reviewers of our papers on evaluations of the technology’s use have commented on a number of occasions that they would like more straightforward logistical and pedagogical information and learning about how the systems were used: information that may not have been relevant to the particular focus of the paper. It appears that the reviewers themselves, not surprisingly, were new to the technology, could see the potential benefits, but then had many questions not answered in the papers.

This chapter, therefore, attempts to answer such questions as they apply to one particular educational setting: that of using the ARS in every session of an existing lecture-based module. Many early adopters choose to use the technology in just one or two lectures, or in a large-group tutorial, to try it out, but this chapter describes a 4-year use of the technology where, from the outset, the aim was to use the ARS in as many lectures as possible in an existing lecture-based module. Note the crucial difference here, compared to other reported uses of ARS in a whole course (e.g., Dufresne, Gerace, Leonard, Mestre & Wenk, 1996; Mazur, 1997; Nicol & Boyle, 2003), where the course and session structure was radically redesigned to incorporate the use of an ARS. For pragmatic reasons, the course under discussion here has largely retained its original structure, a feature that is likely to be valuable to other potential adopters. My aim here is not to presumptuously tell readers how the technology should be used, but rather to highlight issues that have arisen over 4 years of this style of use, issues that I would have found useful to know more about at the start of the process. Addressing these issues has had an effect on the course, and the importance of the ARS, at least as reported in student feedback. The bar chart of Figure 1 shows how students have responded to the question “How useful do you think the handsets are?” over the first 3 years of use, and shows a steady increase in their perceived usefulness over this period.

The chapter presents the context in which the use of the ARS was embedded, and then explores various educational rationales behind the questions that were presented to students. A number of tips on how to format a 50-minute lecture with ARS questions are then presented, along with a range of differing styles of question. Remediation issues are then discussed, (a crucial aspect of any ARS use) followed by the physical requirements for creating ARS-enabled lectures. The chapter concludes with a summary of the major issues and questions that should be answered when considering using an ARS in the style under examination here, and an outline of areas for further work.
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