

# Audience Response Systems and Face-to-Face Learning

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## INTRODUCTION

Audience Response Systems (ARS) are gradually being introduced into educational settings, having previously proved their value in business. Hand-held keypads allow students to enter data in response to questions or statements displayed on a public screen. The captured data is displayed on the public screen and enables both academic and students to immediately see how the whole group has responded. The anonymity afforded by an ARS encourages individuals to fully participate without fear of ridicule or loss of face.

The technology is simple to use by both students and academics, can be used with large or small groups and has applications in all topics of study and at all levels of study. ARS are highly portable, require very little set-up time and are easy to use by anyone who has had some experience with software such as PowerPoint.

## BACKGROUND

ARS developed within the general area of Computer Supported Collaborative Work (CSCW) and have been used in the business community since the late 1980's. Early work in the use of computer-based systems was concerned with providing managers with decision support tools that would provide support for, and improve

effectiveness of, decision-making especially when dealing with semi-structured or unstructured situations. The systems were developed to be under the control of decision makers and support the process rather than attempt to automate it. Keen & Scott Morton (1978) initially described as Decision Support Systems they have also been described as Group Decision Support Systems (GDSS). Mallach (1994, p.7) defines a GDSS as "an information system whose primary purpose is to provide knowledge workers with information on which to base informed decisions". Young (1989, p.8) describes the key feature of such systems as being that "... they are intended to interact with and enhance the special mental capabilities of the user, thereby facilitating learning, creativity...". A key word in the name of these systems is "support", that is, they enhance the process they are supporting by providing rapid data capture, effective processing tools and immediate feedback to the participants as part of a broader human process.

The initial systems were based on personal computers and often appeared in networked laboratory-type settings but smaller hand-held systems using keypads were developed. From the early 1990's onwards these systems have been adopted by a growing number of businesses and are now most commonly described as ARS. The relatively low cost and ease of use meant that they attracted the attention of champions in organizations who often had a specific use for the system, often in the areas

*Table 1. Typical uses for ARS in business*

Quality (Self assessed, Baldrige, EQA...)	Control risk self assessment (CRSA)
Evaluating new product ideas	Budget and capital resource allocation
Corporate governance	Succession planning
Appointment interviews	Corporate ethics
Team building	Idea sharing, testing, approval
Conflict management	Customer value, customer satisfaction
Employee and customer focus groups	Stress management
Counselling related	Time and Project Management
Readiness for change	Benchmarking
Tapping employee wisdom	Product development

of quality self-assessment or team building. The initial emphasis on decision-making has now been broadened by recognition that these systems can provide support for a wide range of business processes. The feature of anonymity provided by these systems offers an opportunity for use in environments where there may be holders of widely differing levels of organisational power and authority engaged in discussion. The ease of use, portability, and flexibility in application provides an opportunity for groups to engage in a variety of reflective practices, with groups ranging from eight through to several thousand participants.

Typical business uses for these systems are shown in Table 1. Many of them offer great potential for adoption in higher education learning environments where they can be used as support tools in a variety of subject areas and teaching and learning philosophies.

### PRACTICAL SYSTEMS

In practice these systems comprise hand-held input devices that transmit data to a receiving device connected to a personal computer. Software processes the data and presents it in a variety of formats to the participants for discussion. Key components of the system are:

- Hand-held input devices. A variety of sizes and designs exist, the credit-card size keypad (Figure 1) being typical of the most recent development.
- Receiver. Utilizes infrared or other wireless communication media to collect data from the keypads.
- Software. Manages collection and processing of data and supports display of the data in a variety of presentational formats. The software may be embedded in other container software such as PowerPoint. The output from the system is usually displayed on a public screen via a data projector (Figure 2).

### ARS IN HIGHER EDUCATION

The purpose of an ARS is to provide a system and set of tools that can support groups engaged in a face-to-face process that involves examining propositions, exploring alternatives and obtaining timely feedback from the participants engaged in the process. Draper and Brown (2004, p20) suggest that “The dream of personal teaching is really about adaptive teaching; where what is done depends on the learner’s current state of understanding”. ARS can provide timely feedback to support this adaptive

Figure 1. Credit-card size keypad (image courtesy of KEEpad Pty Ltd)



teaching goal, but Draper and Brown make the point that this can only be achieved through appropriate pedagogic design and action and not through the technology alone. In one-to-one or small group settings the learning facilitator may have a sense of the current state of the learner if the learner feels sufficiently comfortable in revealing it. With large groups in more formal settings the availability of cues to the learning facilitator can be more limited. The immediate feedback that an ARS offers can publicly identify differences or similarities of opinion within groups and provide a trigger for further discussion or analysis of data and re-adjustment of pacing or content. ARS can be used with both large (hundreds of participants) and small groups to support lectures, workshops, seminars, and to explore a wide range of subjects. They can be used at undergraduate and postgraduate levels, and within traditional and post-modern paradigms. Subject areas that value discussion, debate, multiple interpretations and direct challenges to accepted wisdom can benefit from this technology, but equally an ARS can be used in subject areas where demonstration of understanding of a fixed body of knowledge is vital. ARS can be used for formative and summative assessment, in the gauging of preliminary level and subsequent stages of understanding of a subject and in the exploration of the concepts that underpin critical issues.

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