

LOLA Project Plan

Integration of Group Response Systems into Teaching and LOLA, the Missing Link in Computer Assisted Assessment

Summary and Context

The Socratic method of teaching by questioning encourages learning by opening up a dialogue between teacher and student. Its drawback is the difficulty in providing effective, rapid feedback to groups of students. My innovative use of Group Response (GR) systems¹ (cf. the limited systems used trivially in popular TV quiz programmes,) is helping me to overcome this problem by making my lectures more interactive.

The LOLA (Live and On-Line Assessment) project aims to establish a pedagogically sound framework for the use of GR systems in interactive classrooms. It will focus specifically on formative in-class assessment, which I view as the missing link between diagnostic and summative computer assisted assessment (CAA). Conventional use of formative CAA involves direct interaction between computer and student only. The exploitation of a GR system enables teacher, students and learning technology to become part of a three-way interaction, which is missing from standard, formative CAA. The establishment of a model for using GR systems in formative assessment, including techniques and guidelines, lies at the heart of this project. The extra inclusion of on-line assessment will extend the range of application and accessibility.

GR systems have already been used successfully by me and colleagues in the University in several subject areas for a wide range of purposes, e.g. revision classes, peer assessment. The original system adopted, *Teamworker*, was superseded by *Varitronix PRS* two years ago, because of its cheapness and versatility. Together with colleagues in my learning technology group, I have been exploring new ideas for the ways in which GR systems can be exploited during interactive classes and am presenting four conference papers on the subject this summer.

I have made effective use of CAA for 10 years, was a pioneer of on-line assessment 4 years ago and continue to be at the forefront of on-line CAA development and application. My current uses of CAA are for diagnostic, follow-up, practice (formative) and exam (summative) testing. I define the new GR systems as 3rd generation CAA², because of the higher level of direct interaction between computer, lecturer and student.

Aims

The project aims to develop, apply and evaluate interactive assessment technology, specifically:

- to establish a set of practical techniques for using GR systems and LOLA in teaching
- to identify guidelines for best practice in the delivery of formative assessment in GR supported classes
- to develop an integrated model for teaching, learning and assessment which uses GR systems and LOLA
- to evaluate the effectiveness of the new approach for student learning

Implementation Plans

The first part of this project will focus on the application of GR systems to formative assessment within my own teaching of maths, astronomy and computing. I will use GR systems to provide a missing link in the pattern of assessment as students progress from their initial diagnostic testing to final summative exams. There has been no structured and methodical use of GR systems for formative assessment before. An important preliminary part of this project will be to study local, national and international uses more thoroughly. This will help me to develop my own techniques and provide a model, which can be applied by any department or institution prepared to make a modest investment in this emerging technology.

The second part of this project will extend the use of GR systems by combining their use with on-line CAA. In trials, I have found that GR systems can be used effectively in conjunction with standard on-line CAA systems and this is a specific area, which I wish to explore further. Several possible improvements to LOLA have already been identified. I have discussed them with commercial software developers, who are keen to cooperate, and a prototype system will be included in the project Web site.

Lack of good communication between teaching staff, our educational technologist, department and university technical support and commercial developers is a possible obstacle, but my past experience on other major projects should avoid this problem. I am confident that I have the necessary support to deal with technical problems, ranging from hardware issues in individual lecture rooms to browser and software incompatibility.

Timescales

July 01 – July 02	Information gathering on individual experience with GR systems
July 01 – Dec 01	Further development of a teaching model for the integration of GR systems
Sept 01 – June 02	Implementation of LOLA within local teaching scheme
Sept 01 – Feb 02	Documentation of the 'CAA Blueprint' for the UK CAA Centre
Mar 02 – Feb 02	Implementation of an integrated on-line system and LOLA Web site
Feb 02 – Feb 03	Extension of use to on-line teaching on overseas collaborative courses
July 03 – July 04	Project evaluation, documentation and dissemination

¹ also known as an audience/class/personal response system

² 1st generation CAA = Optical Character/Mark Reader (OCR/OMR) systems

2nd generation CAA = computer based systems, e.g. Question Mark

3rd generation CAA = GR systems, e.g. Varitronix PRS

Collaboration

Project involvement and support has already been agreed with:

Prof Jim Boyle (Strathclyde University) – use of interactive lecture systems

One of the project aims is to collect experience of using GR systems. Prof Boyle shares my interest in using GR systems effectively and, as a pioneer of their use, is keen to support this project.

John Kleeman (Managing Director, Question Mark Computing) – CAA software development

Better integration of GR systems and on-line assessment is expected to require some software customisation, e.g. modifications to create a software bridge. I have already discussed the project with QMC, who would provide design input and advice without charging consultancy fees, because of its interest to other customers.

Dr Joanna Bull (UK CAA Centre, Luton) – national CAA support

It has been agreed that a new section of the recently published 'Blueprint for CAA' will be written to cover GR systems. The centre will be available for general CAA support.

Pam Bishop (LTSN MSOR, Birmingham University) – maths support network

LTSN support in my subject area has already been extremely valuable in establishing contacts and continues to be offered for this project. The assessment consultant for the centre is:

Prof Cliff Beevers (Heriot-Watt) – maths CAA, co-director Scottish Centre for On-Line Learning & Assessment

Having worked with Cliff on the TLTP Mathwise project and having remained in contact, he remains a valuable source of advice and has agreed to collaborate.

Expenditure

Research Assistant

£15K

My research student is currently working on "innovative approaches to on-line CAA in mathematics". He has the necessary technical expertise and would be employed part-time for two years in order to support software developments, including the LOLA Web site.

Software development

£10K

Question Mark Computing have agreed to waive their normal consultancy fees, in order to pursue innovative developments in the area of GR systems. A fee would be paid for software customisation required to improve the usability of interactive on-line assessment.

Part-time teaching cover

£10K

I would like to buy out a modest proportion of my time in order to work on this project.

A university part-time staff member is available for cover.

Collaboration expenses

£8K

This would cover both my own and collaborators' travel expenses, plus incidental expenses for collaborative partners. A US visit to Prof Bill Gerace and his group at the University of Massachusetts is also proposed.

GR system upgrade

£4K

Currently the university has 250 handsets available for my use with the PRS system. Purchase of extra handsets (30@£45 = £1350) and receivers 6@£176 = £1056) for exclusive use would be desirable, but not essential.

Similarly, system upgrades or new systems (E-Instruction) would also be considered as they became available.

Contribution towards conference, workshop attendance (fees/travel)

£2K

Further support would come from university department staff development and university T&L funds

Meetings with other Fellowship holders

£1K

Indicative Outcomes

- identification of other institutions using GR systems and their current practices
- development of effective techniques for exploiting GR systems in formative assessment, guidelines on their sound pedagogical use and a model for their integration into teaching schemes
- evaluation of the effectiveness of the new approach for interactive assessment
- promotion of LOLA as the missing link in an integrated strategy for assessment

Dissemination Plans

- documentation of GR systems in an extra section of the national CAA Centre "Draft Blueprint for CAA"
- LTSN publications and workshops
- creation of a LOLA Web site, including a PRS club for GR system users and a prototype on-line system
- conference papers and workshops on LOLA and its effective use; the following conference papers relating to the LOLA project have already been accepted:

2nd Intl. Conf. on Technology in Teaching & Learning in HE, June 2001 and 5th Intl. Conf. on CAA, July 2001

Integration of Group Response Systems into Teaching and the Missing Link in Computer Assisted Assessment

5th International Conference on Technology in Mathematics Teaching, August 2001

New Approaches to Computer Assisted Assessment for Higher Level Learning

Association of Learning Technology Conference ALT-C, September 2001

From On-Line Assessment to Group Response Systems: Bridging the Assessment Gap with LOLA