# Update on the National TLTP3 Project 'The Implementation and Evaluation of Computer-assisted Assessment'

#### Joanna Bull

CAA Centre, Teaching and Learning Directorate, University of Luton, Luton, UK, URL: <u>http://caacentre.ac.uk/</u> Email: <u>info@caacentre.ac.uk</u>

### Abstract

The Computer Assisted Assessment Centre is a TLTP3 project which aims to disseminate models of implementation and evaluation, good practice documentation and staff development materials and to support CAA activity throughout the HE sector. Computer-assisted assessment can be used to enhance the student learning experience, expand assessment processes and potentially provide efficiency gains for academic and support staff.

The project is undertaking a range of activities including conducting a literature review, running workshops and drop-in sessions to introduce consortium partners to CAA and the piloting models of implementation which are currently under development. In January 1999 a national survey of CAA was conducted. The survey aimed to identify the obstacles and success factors for the implementation of CAA, the pedagogical benefits and limitations of CAA and the type of support available to academics who use or wish to use CAA. The survey results are currently being analysed and preliminary findings concerning the responses of academic staff are reported.

### Introduction

The Computer-assisted Assessment Centre is a three year project funded under TLTP phase 3 which aims to research and develop protocols for the effective and innovative use of computer-assisted assessment (CAA).

CAA refers to the use of computers in assessment. The term encompasses the use of computers to deliver, mark and analyze assignments or examinations. It also includes the collation and analysis of data gathered from optical mark readers (OMRs).

CAA can be used to enhance the student learning experience, expand assessment processes and potentially provide efficiency gains for academic and support staff. The project seeks to promote better understanding of the variety of methods and advantages of CAA. By identifying existing good practice in the UK, the project hopes to emphasize ways to overcome the organizational, pedagogic and technical difficulties of using CAA in higher education.

The project aims to:

- Identify and develop good practice in embedding CAA within the curriculum.
- Develop measures to evaluate the educational and cost effectiveness of different types of CAA.
- Produce staff development and training materials to enable dissemination and implementation of good practice.
- Develop and pilot a range of models and guidelines which focus on the strategic implementation of CAA within departments, faculties and institutions.
- Provide a national centre for higher education to disseminate models of implementation and evaluation, good practice documentation and staff development materials and to support CAA activity.

The project is led by the University of Luton, with the universities of Loughborough, Glasgow and Oxford Brookes as consortium members.

## Activities

Since October 1998, the project has been undertaking a range of activities which will support the piloting of models of implementation and the identification and development of best practice. A literature review is being conducted which will assist in identifying best practice in the pedagogy, operational and technical issues of CAA. A number of models with supporting documentation have been drafted which aim to guide individuals and departments in using CAA with a range of delivery mechanisms and assessment types.

Introductory workshops and drop-in hands-on sessions have been held at Oxford Brookes University for academic staff. These activities aimed to raise awareness of the advantages and limitations of different types of CAA, explore different question types and elements of question and test design and give participants the opportunity to try out different CAA tools. As a result a number of pilot projects are currently being defined in the schools of Biological and Geological Sciences, Social Sciences and Languages. The pilots will use and evaluate the models to implement CAA during the next academic year.

Piloting of the models will be conducted by consortium members internally for the purpose of evaluation and refinement. In the final year, the models will be available for piloting outside the consortium. Assessment is a generic issue, a key activity of higher education institutions and of concern to most academics and many support staff. Therefore, the implementation of CAA has wide ranging pedagogic, operational and technical implications. Depending on the type and extent of CAA it can impact on the activities of academic staff, as well as technical and administrative staff, throughout an institution.

## National Survey

In January 1999 a national survey of CAA was conducted. The survey drew on the methodology and results of a previous survey conducted by Loughborough University in 1995 (Stephens and Mascia, 1995). The survey aimed to identify the following:

- obstacles and success factors for the implementation of CAA,
- pedagogical benefits and limitations of CAA,
- the number, type and educational level of assessments in use,
- the type of support available to academics who use or wish to use CAA
- and regulations, policies and procedures for the use of CAA.

The survey was designed to seek the opinions and views of both users and non-users of CAA and to gather information about perceptions of and attitudes towards CAA. The questionnaires will be followed up with telephone and face-to-face interviews and focus groups which will seek to bring together different groups of staff to discuss the role and potential of CAA within their discipline and institution.

## Identifying Respondents

Identifying staff engaged in supporting CAA activity proved quite challenging. The nature of CAA means that often it does not sit easily in any particular department's or individual's remit. It may be that individuals within different central service departments, such as computing services, examinations offices and staff development, take responsibility for different aspects of CAA. Different university structures mean that it is often problematic to identify relevant central service departments or individuals who have assumed such responsibility.

Through the literature review it was recognised that a range of staff within institutions were often involved in creating and delivering CAA. In order to capture the views of different groups of staff who may be involved in both using and/or supporting CAA, four questionnaires were designed and targeted at the following groups: academics, staff developers, quality assurance staff and educational technologists. The questionnaires were piloted in consortium institutions prior to being distributed within the higher education community.

## Design of the Questionnaires

The questionnaires asked respondents for a wealth of information about the use of CAA both at an individual and an institutional level. Academic staff were asked to provide information about:

- their experience (if any) of using CAA,
- their likelihood to use CAA under differing circumstances,
- their perception of the benefits and limitations of CAA,
- the critical success factors and obstacles to using CAA,
- the type and level of support which would be needed
- and the details of any CAA delivered.

Additional questions also covered the use of question banks and sharing of questions, student evaluation and use of CAA with students with special needs.

The three other questionnaires covered similar issues in less detail and asked more specific questions about:

- the type and level of institutional support, funding and strategy to enable the implementation of both computer-aided learning and CAA,
- the provision of staff development and training for staff involved in delivering CAA
- and examination regulations and assessment policies concerning CAA.

## Distribution

Through the literature review and previous contacts, a group of approximately 1,000 academics and educational technologists were identified as being interested in the use of technology and assessment in higher education. This group formed a core of respondents whose responses could be logged and followed up. This group was mailed a personalised copy of the questionnaire and forwarded a second letter if they did not respond initially.

In addition to this group of 'known' respondents, questionnaires were distributed by a range of methods aimed to gather the views of those using and supporting CAA and those who did not. To achieve wide coverage of the higher education community and a greater response rate, questionnaires were mailed through various existing organisations and undoubtedly there was duplication in the coverage.

A number of existing networks and organisations were used to distribute paper copies of the questions including: CTI Support Service, CTI Centre for Land Use, the Association for Learning Technology, CTI Library and Information Studies, CTI Textual Studies, the Royal Geographical Society and Universities' and Colleges' Staff Development Agency. In addition, quality assurance questionnaires were sent to all heads of quality assurance, and the University of Edinburgh distributed questionnaires to all heads of department, quality assurance staff, staff developers and educational technologists to provide the basis for an in-depth institutional case study.

Electronic versions of the questionnaires were made available on the project web-site and a number of mailbase lists were used to request completion of the questionnaire by various groups. The questionnaire was also distributed through the Humanities and Arts higher education network.

In total 10,500 paper questionnaires were distributed, 1,000 of these were targeted at specific individuals, 270 were targeted at staff developers and 142 were aimed at quality assurance staff. The views of educational technologists were sought by posting messages on specific mailbase lists and through the group of 'known' staff. The remaining questionnaires were aimed at academic staff and it is estimated that there was overlap in the distribution lists of the CTI Support Service and the individual CTI Centres, and that of the Association for Learning Technology.

#### **Preliminary Findings**

The results of the survey are currently being entered and analysed, so only preliminary findings concerning the responses of academic staff are reported here. The response rate for the group of 'know' respondents after two mailings was approximately 25%. It is difficult to estimate the response rate for the wider mailing due to the duplication of mailing lists used to distribute the questionnaire. As a rough estimate we are assuming that least 2,500 of the questionnaires represented duplicates which indicates that the response

rate was around 10%. A small percentage of the questionnaires were returned to us as unknown recipients.

Of the 753 questionnaire responses to date 77% were from academic staff, 11% educational technologists, 9% staff developers, 3% were from quality assurance staff. The survey was successfully targeted at non-users as only 40% of the academic staff who responded were currently using CAA.

There are a wide range of subject areas in which CAA is being used, which as might be expected, are biased towards science, engineering, medicine and allied subjects and computing. However there are also a considerable number of examples of use in subjects such as, business, sociology, design, geography and publishing history.

A PC-based closed network is the most common delivery mechanism, with nearly half the assessments being delivered in this way. Almost equal amounts of academics use optical mark readers and the web to deliver assessment. Interestingly, a large proportion of CAA is summative, with a smaller amount of formative assessment and only a minority of diagnostic and self assessments being delivered. The most common question types in use are multiple-choice and multiple response, which may be a result of the use of OMR. Text and numeric input were the second most common question types, however there were only a few examples of more innovative graphicallybased question types being used.

Academic staff are most likely to use CAA if, either tests were available and computerised for them or, they created the test and someone else computerised it for them. The main advantage of using CAA are seen to be the speed of feedback to students, statistical analysis of results and automatic marking. The main disadvantages are perceived to be access to and reliability of hardware and software, the amount of time needed create and organise delivery, and the difficulty of writing good questions.

The questionnaire asked respondents to identify the critical success factors for the implementation of CAA. At the level of the individual academic, time to undertake pedagogical training and write questions is considered one of the most important factors. Also key for individual academics is access to question banks, good technology and technical support. Awareness and availability of relevant examples and supporting materials is considered important in helping academics to adopt CAA. The attitude of the organisation and its willingness to change are considered critical factors, as is having a good pedagogical understanding of assessment.

At an institutional level, the availability of technical and other support staff is seen to be crucial by many respondents. Access to hardware and 'easy to use' technology are also key factors in implementing CAA effectively within an institution. Institutional commitment, support from senior managers and strategic guidance are also mentioned by many respondents as having a key role to play in successful implementation. One respondent identified that *'recognition that CAA is a valid form of assessment'* is crucial to adoption at

an institutional level, while another stated that, 'a commitment to content over and above infrastructure' would help ensure the successful implementation of CAA.

The greatest obstacle to successful implementation of CAA at an individual level is seen to be time - for training and writing questions. Attitudes and perceptions of those within the institution are also seen as important – many respondents quoted '*inertia*' '*apathy*' and '*ignorance*' as reasons why CAA implementation may fail. Other factors which figured highly included: lack of understanding of the potential of CAA; a fear of technology; failure to understand the pedagogical issues and the lack of credit received for teaching and learning initiatives. Limitations of question types and the perception that CAA could not adequate assess higher order skills and arts and humanities based courses is also mentioned in the responses of academics.

At an institutional level funding is seen to be the greatest obstacle to institutional implementation of CAA. Respondents also considered rigid assessment structures and the lack of suitable computing resources and infrastructure prevented implementation. Again, the ethos and culture of the institution is considered by many respondents to be an obstacle to successful implementation. Institutional resistance to change, lack of strategy, failure to support new ideas and insufficient understanding of senior managers are some of the reasons academics felt influenced their institution's ability to use CAA.

#### Conclusion

The preliminary results of the survey indicate that time, technical and staff development support and institutional support and commitment are key factors in successfully implementing CAA. Further analysis will allow a more accurate picture of CAA activity to be established. This will help to inform and guide the work of the project in developing implementation models and good practice.

The national survey has provided an opportunity to identify those supporting CAA more accurately. It is evident that there are a number of groups of staff supporting CAA activity. Their activities and needs will vary depending on the type and level of support that they provide in implementing CAA. Clearly each of these groups will have unique needs and will in the future require different types of support and guidance to effectively implement CAA.

#### References

Stephens, D. and Mascia, J. (1995) Results of a Survey into the use of Computer-assisted Assessment in Institutions of Higher Education in the UK, 1995. Available from: Flexible Learning Initiative, Loughborough University.