An integrated environment for music education

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Abstract: The University of Glasgow Music Department's computing resources have been developed so that they now underpin the creative, research, teaching and management functions of the department. This report focuses on the implementation and evaluation of computer-based teaching and learning tools which are now in use across the music curriculum.

Keywords: computer-assisted learning; implementation; evaluation.

The Department of Music at the University of Glasgow has many years' experience of using its networked computing resources as the central component of courses in computer music, sound synthesis, acoustics and music technology. Recently the network has been expanded (see Stephen Arnold, Multi-Participant Interactive Music Services, elsewhere in these Proceedings) in an initiative to encourage more students to make full use of the department's IT resources, whether or not they are specifically involved with music technology topics. A full range of applications, from generic (text processing, dip tools, email, internet tools, World Wide Web) to specialist music applications (music notation processing, sequencing, synthesis and editing packages) as well as specifically authored coursework, has been integrated into a rich learning environment which fully exploits networked resources and has some impact either as a resource or as a learning aid on the studying routines of all students in the department. This work is taking place under the auspices of Glasgow University's Teaching with Independent Learning Technologies (TILT) project [Arnold 1994, 1995] which is itself part of a nationwide, government-funded initiative to deliver computer-mediated learning into the higher education sector. The Music project deals with the creation, implementation and evaluation of multimedia teaching and learning resources and delivers computer-assisted learning into many of the more traditional areas of the music curriculum.

Having now introduced courseware packages and computer-mediated methods into various courses, and evaluated them with the help of independent experts, we describe our experience and report some of our evaluation results. Our data is gathered from various measures such as questionnairenaires, confidence logs, focus groups and resource usage logs which are conducted with complete classes at various stages of the year. It is tempting to assume that once the right hardware and software is in place, that increased student learning will inevitably follow; as the first case study illustrates, the introduction of computer-assisted learning is not that simple.

The first example is a courseware package designed to be used as a self-study resource on open access for first year students in musicianship skills. The package provides interactive exercises for students to practice aural skills (such as dictation and discrimination) in a repertoire (16th century sacred polyphony) that is probably unfamiliar to them before they come to university. The exercises are supported by tutorial materials aiming to reinforce learning points in lectures and provide aurally-based revision material. The package is designed and authored in-house using the authoring application HyperSense from Thoughtful Software. The notation application Calliope, written by William Clocksin of Cambridge University's Computer Laboratory, is used for the music notation and sound examples in the exercises. 'Calliope is an versatile and fully-featurated notation editor for Nextstep which we now use extensively in the department for purposes ranging from an ambitious early-music publishing project to student assignments. We have piloted an instructional package for learning Calliope and plan to develop this further.)
The 16th century musicianship package was introduced into a course which seemed to provide the optimum conditions for a successful implementation of a computer-assisted learning resource: there was a large class with adequate face-to-face teaching time; the students came into the course with a very different skills base; there was a need to acquire skills through repetition and practice; the pilot study with a small group of students had good results and showed that students found the package both easy to use and beneficial. However, our evaluations of the main implementation of the package showed a very poor take-up rate among the target population of students. Further investigation revealed that the intended mode of use of the package (self-study, on open access without timetabled (so sessions) demanded an independent approach to study that many first year students may not possess. As the only computer-based element within a traditionally taught course the implementation of the package needed to be carefully managed.

We are planning to include more computer-based packages in this course, but we will implement them differently, ensuring that all staff teaching the course know how to promote them and that students are given more study skills guidance about how to incorporate them into their learning strategies.

Our second, contrasting, example is NetSem, a system of email conferencing, which uses standard NeXT mail software for conducting electronic seminars on the undergraduate 20th-century music-history course [Duffy]. We construct email groups consisting of 5 students and the 3 members of staff who teach the course. The students take turns to present their seminar paper as a word processed document which is made available in a common area of the network. The student group and staff members then debate the issues raised in the paper via email, sending contributions to their email group. We have found that the quality of music-history seminars has improved markedly as the system encourages lively and informed debate; asynchronous conferencing gives seminarians time to reflect on and research their contributions rather than having to make instant judgements on unfamiliar and sometimes difficult or complex material. There are also significant practical advantages: timetabling clashes are resolved, the system is convenient and easy to use, and is straightforward to set up and run. Future plans include exploiting global internet resources, extending the discussions to link up with students in a remote location and optimising the multimedia aspects of both presentations and contributions to seminar discussions.

In contrast to the courseware package described above, NetSem is compulsory for those students taking the 20th century history course and is embedded into that course as an essential component. In addition, both students’ electronic seminar presentations and contributions to the discussions are assessed. Students thus have a strong motivation to take part; our evaluation results show that, although there was some initial resistance, participants now report that they are confident and competent users of the system, that 68% report preferring email seminars to conventional seminars and that 91% report that they enjoy doing them. The success of this system is due in part to the fact that it uses very adaptable generic software: students realise it is advantageous for them to learn how to use the applications they might need for NetSem (email, word & notation processing, sound & graphics packages) and discover the potential of various computing resources for all aspects of their study. The fact that some of our NeXT computers are now located alongside traditional paper-based resources in the small departmental library (which also serves as a social centre in the department) has also played a significant part in a change of culture among the students towards more pervasive computer usage. We now have the integrated computing environment: we are learning how best to utilise its use alongside our other resources for teaching and learning.

References