

Innovative Approaches to Teaching, Learning and Research with ICT

Introduction

New technologies are fundamentally changing the ways in which teachers teach and pupils learn. As such, they represent a fascinating area for the researcher. The following papers represent a snapshot across a broad range of current research in this area.

You are invited to attend this symposium to hear about this innovative area of music education research. Alongside these papers, there will be opportunities for you to engage practically with the technologies and processes of the research activity through a series of linked workshops. These workshops have limited spaces so please check the conference notice board and sign up early. The presentations are open to all.

We hope that you will enjoy the symposium and its various activities. We all look forward to the opportunity to share ideas, engage in debate and move our research forward into new, yet uncharted, territories.

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Pictures at an Exhibition: Expanding the boundaries of collaborative composition through imaginative uses of new technologies

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Introduction

Pictures at an Exhibition was an innovative project that combined instrumental and technological approaches to composition with two groups of high school pupils. The starting points for this work came from a group of young offenders who produced a series of black and white photographs reflecting their prison environment. These pictures were used as stimuli for a composition, facilitated by two composers-in-residence. The final piece mixed live instrumental music with computer-manipulated samples triggered live on stage.

Key Findings

- An integrated approach to practice and research in arts and music education generated informative and challenging outcomes;
- Contrasting compositional and performance techniques, using a visual stimulus, promoted social inclusion and provided an exciting end product.

Aim of the research

- To expand the boundaries of compositional and performance processes through the innovative uses of ICT.

Method

Previous projects (*Reflecting Others* and *Crossing the Tracks*) had successfully used a range of qualitative research methodologies, including action research and naturalistic enquiry. This research is based on reflective accounts written by project leaders, questionnaires and follow-up group interviews with all pupils.

Main research findings

- Key to the success of the project was the involvement of two artists: the instrumental composer David Knotts and the electroacoustic composer Mike Challis;
- Composers from ‘opposite ends’ of the instrumental/technological spectrum provided an excellent pedagogical and ‘inspirational’ balance;
- Basic structures helped pupils with composition processes and choices;
- Simple technologies proved reliable in performance and an excellent introduction to mixing live and recorded sound.

Developing Thinking Skills Through Music with ICT.

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Fred Longworth High School is an 11-16, comprehensive high school on the outskirts of Greater Manchester. It was the north’s first specialist Performing Arts College and has been at the ‘cutting edge’ of music technology for many years. The school is equipped with two full rooms of PCs running many types of music software. There is also a state of the art 24-track recording studio. As a teacher, and then Head of Music, at the school I got many chances to develop new ways of working with computers.

Working within a technology rich and artistically focussed school it is difficult to imagine a subject that lends itself more beautifully to the refinement of thinking. Musical studies allow pupils the freedom to question what they think and why they think it, to make mistakes and to question their decisions, to make assertions without being told the right or wrong answers and to have the freedom to voice and explore their own ideas.

High-order thinking skills are linked to an increase in the quality of creative thinking. The aim of the Wigan Arts, Reasoning and Thinking Skills (ARTS) project is to

accelerate adolescent development towards these high-order thinking skills through the medium of drama, music and the visual arts. Thirty intervention lessons have been designed to promote reflection within cognitively demanding arts activities. Through these lessons pupils are induced into processing more chunks of information. Over time, we believe this will improve their general cognitive performance.

The project team developed a taxonomy to guide the design of the thirty intervention lessons and to show the relationships between the defining reasoning patterns for each arts subject and children's cognitive development. Each lesson is designed to focus on a particular reasoning pattern and accelerate cognitive development using a strong psychological model. This is based on Piaget's and Vygotsky's ideas of formal operational schemata and social construction.

Wigan ARTS is a practical project investigating the links between music education and the development of thinking skills. A practical trial and ongoing research is at present being run in conjunction with several schools in Wigan.

This presentation will highlight and demonstrate these positive practical links, showing how they can help to transform the use of ICT and approaches to creative music making.

Pedagogy Paralysed? Realising the benefits of ICT in music learning

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Introduction

This paper derives from the ESRC Teaching and Learning Programme project, Interactive Education: Teaching and Learning in the Information Age (www.interactiveeducation.ac.uk), whose overall aim is to investigate the ways in which new technologies can be used in educational settings to enhance learning. The project centres on the design of longitudinal teaching and learning initiatives within a number of curriculum areas.

The work is organised around 'subject design initiatives' that consist of interactive partnerships between teachers, teacher educators and researchers. These subject design initiatives are schemes of work that address learning issues in the subject domain. In relation to ICT four additional themes are developed:

- Subject cultures;
- Students' out-of-school learning;
- Management;
- Professional development.

This paper will explore the work of 5 primary and secondary music teachers who are focussing on composing using sequencing software. Their 'design initiatives' have been informed in an iterative way by theory, research-based evidence, teachers' craft knowledge and the teams' expertise. Work in the first phase is complete. All teachers have trialled their initiatives and modified them in preparation for a repeat trial this year.

Methodology

Analysis has been grounded in the data using methods associated with grounded theory (Glaser and Strauss 1967, Strauss and Corbin, 1998).

Methods

The data collected so far consists of teacher and pupil interviews, questionnaires, screen-saves, creative products and video footage. Regular meetings of music teachers involved in the project are held to share learning and teaching issues and research findings. This paper results from the findings following analysis of video footage, supplemented by notes written by students, screen-saves and compositional products.

Key Findings

Themes emerging from the first Subject Design Initiatives related to issues of:

- Sound and space;
- The ICT software and the opportunities and challenges provided by it;
- Teacher support required for work with ICT in composition activities.

Future work

Teachers' study of videos of their first engagement with their Subject Design Initiative and joint discussions with other members of the music team have already affected their pedagogy and changes have been made to the learning and teaching of the second phase. Our approach to video data collection, coupled with multiple file saves of student work, is intended to enable us to focus more closely on the emergent themes. Other emerging themes include:

- Characteristics of the visual representation of musical ideas on screen;
- Pupil collaboration using music ICT;
- Pupil talk around composition with computers;
- Gender issues.

Tuned In

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Tuned-in is an on-line music support project for KS1 and KS2 children. It aims:

- To increase class teachers' confidence and competence in teaching music;
- To broaden children's knowledge and experience of musical styles and resources;
- To promote a broad and creative context for music;
- To provide opportunities for isolated small schools to share musical ideas on-line.

As Primary teachers become more secure with planning and delivering lessons using the Internet, significant opportunities for enhancing the range and scope of music education develop. Increasing access to broadband enables music to be delivered quickly and reliably.

The project was initiated following a pilot of on-line music materials with trainee teachers. Early findings suggested that:

- Although trainee teachers are increasingly confident in incorporating on-line materials in their teaching, there is a lack of appropriate music-focused material;
- Trainees' confidence and musical knowledge was significantly increased through classroom application of the pilot resources.

Discussions with teachers revealed a need for extensive materials to support classroom music teaching. Many teachers indicated a desire to offer children musical experiences beyond those contained within commercial schemes. Many of the QCA units had proved particularly challenging to non-specialists. Aspects of non-western musical styles and effective use of ICT in composing and performing seemed particularly problematic.

To address this, units were developed in relation to the National Curriculum orders and the QCA units. On-line units were designed to:

- Be interactive;
- Address performance and composition;
- Present a focus for six weeks work;
- Develop teachers' subject knowledge;
- Increase pupils' knowledge of musical styles and traditions;
- Develop music across and outside the curriculum;
- Link to performances by other musicians working in the county.

Units contain images, text and a wide range of music files related to the activities. All pupil pages are fully supported, and activities extended, through on-line teacher notes.

The current case study assesses the effectiveness of the materials in developing the quality and breadth of children's experiences. Evidence will be gathered through:

- Observing teaching strategies in using the materials;
- Analysing questionnaires asking teachers to identify how they adapt *Tuned-in* materials to reflect their own needs;
- Informal interviews to analyse the nature of the insecurity some teachers demonstrate towards using on-line materials;
- Interviewing and observing children to analyse their response to the *Tuned-in* materials;
- Analysing the effectiveness of the materials to encourage collaborative performance and composition by small and isolated rural schools.

The following practical session will focus on how the *Tuned-in* units can be applied within a range of teaching situations.

Cross-cultural collaborative computer-mediated composition in cyberspace

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Introduction

Research highlights the important role that music plays in the lives of adolescents, yet the Harland report found that adolescents regard school music as predominantly irrelevant to their lives. However, computers tap into adolescents' natural interest in technology and could enhance their motivation to engage in 'relevant' music-making activities. Music technologies provide access to sophisticated sounds and the working processes of professional musicians within adolescent musical culture. They can also make musical composition accessible to all.

This paper will report initial findings from a project linking schools in the UK with schools in Norway that engaged in cross-cultural, computer-mediated, collaborative composition via e-mail.

Key Findings

- Motivation and enjoyment levels were high;
- Communication took place on both musical and text levels;
- Effects of 'cross-culture' proved to be less important than 'adolescent culture'.

Research Aims

The research was designed to evaluate technological and methodological approaches to investigating the effects of computer mediation, prior musical experience and culture on the process and product of collaborative computer-based music composition.

Methodology and Method

The study was largely experimental in design, grouping individuals into composing pairs (one from each country) balanced for prior musical experience and time available for composition. Prior musical experience in the study was based on whether or not the participants had received formal instrumental music tuition (FIMT).

Participants

Eight participants (4 Norwegian, 4 English) aged 13-14 years formed 4 composition pairs one from each country:

- Pair 1: both non-FIMT;
- Pair 2: both FIMT;
- Pair 3: one FIMT UK one non-FIMT Norway;
- Pair 4: one FIMT Norway one non-FIMT UK.

Procedure

After technology training, each participant was invited to participate in an interview designed to reveal expectations of engagement in the study. Each composing pair had 6 composition sessions (3 in each country). After each session the evolving compositions were emailed between the UK and Norway until completion. After this, each participant was invited to participate in an interview designed to reveal his or her reflections on the study.

Results

The main findings are:

- All pairs were successful in producing a composition that 'pleased' both members;
- All participants reported high levels of motivation, enjoyment and a willingness to continue working with their partners;
- Communication on both musical and 'text' levels was reported;

- ‘Adolescent preferences’ were reported more often than ‘cultural influences’ as reasons for effective collaboration.

Conclusions

Future studies will be naturalistic in design as it was felt aspects of the experimental design could have influenced responses. Changes will include:

- Removing time constraints for training and composing;
- Including opportunities to exchange emails prior to composing in order to build social relationships that should aid communication.

Implications for practice

Employing technology in this way makes collaborative creative music-making possible for all adolescents. Increasing motivation through their interest in technology and growing use of text as a form of communication raises the perception of the relevance of creative music making in adolescent’s lives. This can create an inclusive impression of school music and takes collaboration beyond the classroom to include national and international possibilities.

In the following practical session you will acquire some hands-on experience in order to link theory and practice. After a short training session you will engage in practical activities exploring the technology employed in the reported study.

Implementing and Exploring Virtual Instrumentation Using Software Synthesis to explore the Parameters of Sound

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Music teachers across the country are grappling with ICT that has vastly increased in speed and flexibility. Single independent workstation computers, traditionally seen in music departments as more easily maintainable, have started to be replaced by networked machines even for high-bandwidth processes such as multi-channel audio streaming, or processor-intensive applications such as real time DSP. The development of ‘virtual instruments’ is a result of this increase in processing speed. A feature of these instruments is the ability to trigger excellent quality sounds from software on the host computer, with little or no perceived latency between keystroke and note.

Along with these changes, has come an increased learning curve for teachers and pupils in terms of systems, interfaces and related jargon. This is exacerbated by the fact that

many of the developments in music technology are in *software* processes. These require a higher level of pupil motivation to ensure meaningful learning takes place than would their hardware counterparts, due to the lack of multiple tactile control surfaces with which the pupil can interact.

Other related software technologies are allowing teachers to alleviate this learning curve for pupils, e.g. by making good use of sophisticated desktop publishing tools to produce instruction sheets including graphics and screen-shots.

This research has explored a more complex piece of software as a way of communicating the parameters of Subtractive Synthesis to Yr 12/13 students. Macromedia's Flash allows you to put together interactive screen-based teaching tools that can be viewed in any web-browser. There are advantages and disadvantages in using tools like Flash. Substantial training is often required to allow the teacher to use the program itself, and the related skills of image manipulation and preparation of other digital resources. But once a tool is produced, it can be used repeatedly and could be put onto the school's intranet for access by other departments or pupils.

In this paper I will show the results of using Flash to create a teaching tool that explains the controls of a generic Subtractive Synthesiser. In the practical demonstration I will show the way in which 'Virtual Instruments' are becoming integrated within software sequencer set-ups. I will also demonstrate the ways in which technologies like 'Re-wire' can stream audio from instruments such as sequencers, REX file players and samplers from one virtual 'rack' of instruments ('Reason' by Propellerhead) into the on-screen mixing desk section of a separate standard Audio/MIDI sequencing package (Steinberg's CUBASE SX).