Innovative Uses of Arts Technologies

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What impact have new technologies had on musical practice?

History of music has a lot to teach us in the 21st century.

John Cage (in 1937) stated:

> I believe that the use of noise to make music will continue and increase until we reach a music produced through the aid of electrical instruments which will make available any and all sounds that can be heard. … The present methods of writing music will be inadequate for the composer who will be faced with the entire field of sound. (Cage 1968a, p.4)

In typically provocative style, John Cage neatly summarised what he saw as the inadequacy of traditional methods of music making in light of the changing conceptual basis on which musical materials are defined.

Leopold Stokowski in 1932 wrote:

> One can see coming ahead a time when the musician who is creator can create directly into TONE, not onto paper. (Stokowski 1932)

Varese, in a chapter published after his death, discussed some of the possibilities that such approaches would bring:

> Liberation from the arbitrary, paralysing tempered system; ... the possibility for the formation of any tempered scale; ... new harmonic splendours … new dynamics; a sense of sound projection in space. (Varese 1967, p.197)

The revolution in musical technologies that we have witnessed over the last fifty years has led to a bewildering array of electronic musical instruments and devices. Some of these offer genuinely new and exciting potential, with the possibility to fulfil the prophecies made by Cage, Stokowski, Varese and others within the realm of music education.

For in many respects, the crisis that Cage and others saw confronting composers during the second half of the twentieth century has similarities to those faced by music educators at the beginning of the twenty-first century. Not least is the need for us to face up to increasingly diverse models of musical production and consumption. We need to reconsider at a fundamental level what is meant by musical skills and understanding and how these can best be taught or nurtured within our classrooms. I do believe that a failure

to do this will almost certainly lead to a marginalisation of music within the classroom as pupils develop their musical skills through technology elsewhere. There is an increasingly urgent need for change.

But change for the sake of change will not be good enough. My arguments as laid out below will show how music technologies have enabled my pupils to engage in musical activities and develop musical minds. This engagement was the result of a complicated series of innovative steps that went beyond the technologies themselves, causing me to question the nature of my teaching and the established curriculum. Ellis (1997) suggests that much of the thinking embedded in these new technologies is sadly rooted in an outdated model of educational philosophy. This may well be true in some cases. It is certainly the case that by using ICT in the classroom in a way that is intrinsic to the changing models of musical practice, as illustrated by contemporary musicians and composers, one has to reconsider key components of one's educational and musical philosophies.

But at a practical level I have examined these themes at a number of levels:

- Involvement with electroacoustic composers at the UEA;
- Close working relationship with Mike Challis;
- Observation and work with sound designers and other professional composers around Manchester;
- Through my own recently completed PhD research.

What impact should ICT have on music education?

This work has led me to consider three ideas about the impact that new technologies can have on music education.

1. Intrinsic and Extrinsic Models

At an early stage of my research I hypothesised that ICT can be used in two ways.

1. As tools to facilitate models of composition extrinsic to the technology itself (for example, to use MIDI based sequencers to emulate the performance of a traditional instrumental piece);
2. As tools to generate an entirely new model of composition practice, one that is 'intrinsic' to the technology itself and allows for a greater exploration of sound itself.

The first of these models is still prevalent in schools today and is easily observable in many classrooms. Practically, the most common and obvious outworking is the positioning of musical keyboards alongside computer workstations. These are then connected to the computer via MIDI through the USB ports and linked to a piece of sequencing software. The most direct and simple use of sequencing software is as a tool

for tonal composition and, at a conceptual level, this is where many music teachers are happy working. During my recent visits to classrooms around the north-west of England I have observed teachers and pupils working with melodic and rhythmic ostinati, chord-based compositions, writing music for film (incorporating the use of sound effects) and many other tonal based, keyboard mediated tasks.

I would like to make it clear that there is nothing wrong with any of these tasks in and of themselves. It is possible, and very likely in the hands of a skilful teacher, that these tasks will facilitate pupils in their learning of musical skills and the development of their music understanding.

But I would characterise these approaches as being extrinsic to the potential of the technology itself, i.e. they could be taught through alternative methods without the use of ICT. I was principally concerned with developing a new approach to music education that drew on the intrinsic capabilities of ICT to transform musical practice at a fundamental level.

What changes to music education might an intrinsic model of the use of ICT bring?

I imagined that ICT used in this way could challenge established musical priorities, redefining of musical skills.

2. Changing Musical Priorities

From reflection on my own classroom practice, and the observation of others, many uses of technology in education perpetuated musical models that have their roots in the 18th century. But new technologies can themselves bring about a shift of emphasis in compositional enquiry, away from the traditional issues such as melody, rhythm, or harmony to an increasing focus on dealing with the sound itself, thinking about its intrinsic value and place in a wider musical structure (Théberge 1997, p.186), the inherency of the sonic article (Wishart 1996, p.5).

In many respects though, the pupils' attention will be focussed on the particular aspects of the musical style or genre within which they are engaged. Different musical styles and genres have their own particular hierarchy of musical concepts and practice. For example, sophisticated notions of harmonic development might have been of key concern to composers at the end of the nineteenth century, but one cannot imagine this being a high priority of early minimalist composers in the 1960s. At an early stage of my research I asked myself some questions:

- To use Wertsch's phrase, what are the *cultural tools* of composition for the 21st century? And are they the same as for composers 50 years ago?
- Is the pace of change in adopting these tools and too slow?
- As educators, where and how do our conceptions and pedagogies need to change?

Music education in the UK has developed radically over the last 20 years. Popular music, world music, changes in pedagogy in response to analyses of 'informal' music-making strategies and more. What about a consideration of a more 'authentic' use of ICT in the music curriculum?

3. The Redefining of Musical Skills

> To take full advantage of technology in teaching, we are invited to go to the core of what music is and determine best how to teach what we find. (Webster 2002, p.435)

It appears obvious that composers work in different ways. The skills that they need have to change in light of the technologies that are available to them.

Play video

Take Alex as an example. Here is a composer for whom formal music education was at best an irrelevance and at worst switched him off music completely. When I asked to remember his high school music teacher, he really struggled. Yet here is someone who is an entirely self taught and highly successful sound designer.

Key of the music?
Middle C?

Wishart's discussion in his book *Sonic Art* culminates in the assertion that, at a fundamental level, there is no such thing as an '*unmusical* sound-object' [his italics] (p.8) and that in the future it might be better for 'composers' such as himself to be referred to as '*sonic designers* or *sonic engineers*' [his italics] (p.5). This idea of composition being redefined as sound design or engineering is an interesting one for it identifies a change in function brought about by the use of new technologies in these musical contexts.

For many pupils musicality is caught up and defined by a notion of music performance and skill, nearly always related to a musical instrument. I would often ask my pupils who they thought was musical and why. Typically, answers would come back to me like, "Oh, William's musical because he can play the drums really well", or, "Julie is really musical - she plays her violin in the county youth orchestra". These ideas are routed in traditional beliefs and values towards the production of musical sounds linked to musical instruments and the skill to play them well. These beliefs and their assertions in the classroom context have been well documented by many researchers exploring the establishment of pupils' musical identities through psychological frameworks (Lamont 2002). The purchase of a musical instrument is only the first step in a long process towards mastery of that instrument and a controlling of its sound to match the prescriptions of a musical score or the strictures of a particular musical genre. At an advanced level, the ways in which instrumentalists and composers push at the boundaries of an instrument's capabilities, stretching its sound quality to develop new timbres only goes to show that a musical instrument, as a particular type of technology, is really no

more than a 'field of possibilities' (Théberge 1997, p.187) for exploration and experimentation.

Wishart's conception of composition as sonic design and composers as sonic designers or engineers implies that there are a whole new range of skills and processes that pupils can adopt as they explore and experiment with the nature and structure of sound directly through hardware and software interfaces. As with traditional instruments, the nature of the interface is a vital component in the production of particular types of sounds and the moulding or expressing of these into musical shapes, gestures, phrases and structures.

It is clear then that there are several key aspects of musical practice that need careful consideration and perhaps redefinition as various technologies become more common within the classroom. Teachers need to challenge pupils' often naïve beliefs about what it is to be musical. Similarly, teachers too need to widen their understanding of what constitutes musical compositional and performance activity in the light of the changing practices that ICT are bringing to music in its various genres, particularly popular and electroacoustic music.

So what has my research considered?

Thesis: *Re-imagining Music Education for the 21st Century: Innovative approaches to teaching, learning and research with ICT*

The aim of this research was 'to analyse and evaluate the use of ICT as a way to develop new approaches to music education'.

The aim broke down into a number of specific research questions:

1. What impact does ICT have on the ways that pupils learn about music, particularly composition?
2. How does the incorporation of ICT into the classroom affect our pedagogy?
3. How can teachers develop a model of teaching and research that allows them a greater clarity of insight into the teaching and learning of music with ICT?

Working as a teacher researcher, I used the research methodologies of action research and case study to investigate their work and my teaching.

The final design of my case study methodology (as illustrated on the handout) includes the preliminary case study work that I did in preparation for the three case studies (Case Studies 3a, b & c) that form the heart of my research project. The time spent working on these initial 'trial' case studies was very productive in relation to coming to terms with the case study methodology. It was a chance for me to develop and test out my skills of observation, document analysis, interview and discussion in a range of different contexts (high school, primary school and on location at a special site for school refusers).

The participants in each of the three main case studies (3a, b & c) were all pupils within my classes at Debenham High School. One group of pupils (highlighted by blue text in the above diagram) participated in all three case studies.

The three case studies have been well documented through previous publications (see handout) and I can't go into details today. But my thesis CD contains musical, photographic and video materials from each case study and you are welcome to take one for a small fee!

An 'Implications for Future Work' section follows Case Study 3a and 3b. This was my opportunity to reflect on the case study materials in a developmental manner, a way of looking forward to future work and considering the next 'action step' (Elliott 1991, p.50). Case Study 3c is followed by a comparative case interpretation.

Through my research I have sought to combine the methodologies of case study and action research, together with a heightened sense of reflection, professional development and a notion of playfulness drawn from my metaphorical interpretation of qualitative research as jazz (Oldfather & West, 1994)). I believe that in doing this I have been able to evaluate effectively the use of music technologies within my teaching. An obvious strength of these research methodologies is that, to a large extent, they are an extension of what teachers do best. I remain philosophically and practically convinced that teachers are in the best place to research educational innovation provided they are empowered with the appropriate tools. I found these in case study and action research.

Summary of Findings

I believe that this research has demonstrated that through embracing an alternative vision for the use of ICT in music education that a greater number of my pupils were empowered to produce music in new ways than was previously the case. I am wary of generalising these findings to other schools and other teachers. And I do not want to be accused of beating anyone with an 'ICT is the answer to all your problems' stick. But in this brief epilogue I hope to summarise three challenges to others involved in teaching, research and teacher education.

Expanding our vision

Firstly, teachers need to expand their vision of what ICT is, what it can do and how it can be used as a tool to create a more inclusive music curriculum fit for the 21st century. They will need to:

1. Be ready to embrace change and respond to the new challenges of ICT;
2. Actively seek to learn from other artists and composers who are making innovative uses of ICT already;
3. Be wary of the trap of creating alternative 'educational' cultures of musical ICT that bear little resemblance to what might be conceived as authentic artistic practice;

4. Reconsider curriculum aims and objectives and how they should respond to the changing nature of the classroom environment when ICT is used in the ways suggested throughout this thesis;
5. Respond to the natural pull of these technologies towards the digital arts (Sefton-Green 1999). They should be urged and facilitated to make links across the arts with a naturalness and technological awareness that is seldom evident in our schools today.

In order to make the wider changes within music education we need a new vision. "Without a vision the people perish". What should this vision be?

ICT can bring the gap between what are often our disparate artistic practices within schools. This requires new and radical concepts of curriculum and the way in which we work together as artists.

There is a new world of composition mediated and inspired by the use of ICT. We are only just beginning to access this within school. It is not about music for the page, but rather about re-conceiving all aspects of music education against the concept of a 'cinema for the ears'.

Politically, of course, there are issues surrounding each of these areas that this presentation has not had time to address. But I remained convinced that teachers need more time, space and appropriately differentiated systems of support in order to make progress in these crucial areas.

Teachers are central to true innovation

Secondly, I believe that this research shows that those of us involved in educational research should remember that teachers are in the best place to examine and reflect on approaches towards educational change. The years that I spent working as a teacher researcher were amongst the most exciting and challenging of my research. The methodologies of case study and action research provided me with the tools I needed to give an account of events in my classroom and think through issues that facilitated change in my own practice and provided the opportunities for my pupils' learning. I believe that they have proved particularly useful in respect of giving an account of ICT in the classroom environment.

Teacher trainers have a crucial responsibility

Thirdly, as a teacher educator I believe that this research highlights the crucial role that we have to play in preparing our trainee teachers for full, satisfying and enriching careers as teachers. It clearly shows that a practical knowledge of use of ICT, together with a clear grounding in its application to educational contexts, is crucial for those training to work in music education at this time. It also shows that teaching and research can be usefully combined early in a teacher's career as a way of developing an increased sensibility to pupils and their learning, the organisation and development of interesting curricula and the integration of reflective practice as a key for educational change.

Ultimately, my research aim and questions were formulated and reformulated throughout the period of my research. This brief presentation has attempted to give a flavour of this research activity. I remained convinced that ICT, composition and practitioner-based research should be at the heart of music education and that there still an increasing need for debate amongst practitioners at a deeper level about each of these areas.

But I would like to end my presentation by celebrating the work of my pupils throughout the various case studies described here. They approached the use of ICT, the increasing emphasis of composition in their music education and our often-whacky ideas with naturalness, good humour and inquisitiveness. I am sure that they were often long-suffering too, but I hope that Lachlan Young's words rang true in our experiments and experiences together, and that they will continue to ring true in their future musical lives:

Ears become wired
And minds become strong because
You're speaking the language
The language of music
The door is now open
To learn how to speak.

Murray Lachlan Young
(Found Sound CDROM, 2003)

Play poem