

## Teaching Music with ICT

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### Abstract

*The use of ICT in the music classroom has the potential to challenge traditional approaches to music teaching and learning. Although it can continue to reinforce existing ways of teaching music (i.e. extrinsic to the ICT itself), this chapter will argue for the promotion of new notions of music teaching and learning through applications intrinsic to the ICT. It will draw on recent classroom based research that has examined the uses of technologies through this intrinsic model. It will analyse the pedagogical issues that arise when technologies are applied in this way within the classroom, drawing on the author's own experience of classroom teaching with these technologies and reflecting on their use through appropriate research methodologies. The chapter will end by considering the main implications for the teaching of music in the secondary classroom with ICT, including the importance of thorough planning, inclusion, the role of learning objectives, expanding what counts as music, efficient classroom management, assessment and integration.*

### Introduction

In a technology-rich world we need to review and modernise what and how we learn. Imagine how a graphic designer works today compared with 30 years ago. What should a modernised music, art or design curriculum be like? ... They may use technology as a tool for thinking, making or doing. Technology needs to be used more effectively to help develop learners' enquiry skills, logical reasoning, analytical thinking and creativity. It should support individualised and independent learning, while encouraging wider communication and collaborative learning. (QCA 2005)

The QCA's recent consultation on curriculum change (QCA 2005) highlights the importance of new technologies and their effective use as a key 'force for change' as educators seek to develop a school curriculum fit for the 21<sup>st</sup> century. They ask a key question that we, as music educators, should be seeking to address: What will a 'modernised' (or preferably postmodern?) music curriculum be like? What will it sound like? What will the teacher's role be within it?

This chapter will fall short of answering these questions outright, but it will aim to consider how music teachers should teach with ICT. But even this, in many respects, is an entirely impossible task. There is no single, fixed solution that any given teacher should seek to implement in her teaching. Rather, this chapter will identify some principles and practical issues that any teacher will need to address in order to make effective use of ICT in their own

classroom, acknowledging that these are bound by a unique set of personal, social, curricula contexts.

### Background

The background to this chapter is framed by two important documents published by the Teacher Training Agency (TTA 1999a & b). One of these documents (TTA 1999a) was written to provide teachers with ideas for a range of possible uses of ICT. The second of these (TTA 1999b) was written to inform teacher educators of the areas they ought to be covering in training courses. The content of these publications was important as they gave clear signals about the types of knowledge and practice that music teachers and teacher trainers ought to be developing.

The TTA suggested that there were four main areas of knowledge that teachers needed to develop their use of ICT. They were:

- Planning to use ICT to achieve your teaching objectives;
- Using ICT effectively in your teaching;
- Assessing and evaluating pupils' progress in music having used ICT;
- Personal and professional uses of ICT. (TTA, 1999a, p. 4)

Specifically, the document outlined three key principles for music educators:

- Base your decisions about when, when not and how to use ICT in your lessons on whether the use of ICT supports good practice in teaching music. If it does not, then do not use it;
- In your planning make sure that the use of ICT in a particular lesson or scheme of work directly relates to the teaching and learning objectives you have chosen;
- ICT should allow you or your students to achieve something that could not be achieved without it; or allow you or your students to learn something more effectively and efficiently than you could do otherwise. (TTA 1999b, p. 3)

These three principles seem well founded are useful starting point for our considerations here. They emphasise the importance of ICT in supporting good practice in music teaching. In other words, teachers should not be seeking a new 'shiny' and modern ICT-enriched pedagogy that supplants the many excellent features of their existing music curriculum and associated good teaching practices. Effective music teaching with ICT will not look that dissimilar to effective music teaching. After all, ICT just another tool, medium or set of instruments that teachers will use to allow pupils to achieve the learning objectives that they have set.

However, this analysis does not quite tell the whole story. The third principle is important, stating that ICT 'should allow you or your students to achieve something that could not be achieved without it'. This rightly hints that teachers and pupils should be encouraged to use ICT to extend and develop the music curriculum into new areas, perhaps beyond the reach of traditional methods and practices in music education.

Thinking about new technologies and how they should be incorporated into musical practice is not a new issue:

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 that 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 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.

The revolution in musical technologies over the last sixty years has led to a bewildering array of electronic musical instruments and devices. Some of these offer genuinely new and exciting potential to educators, with the possibility to fulfil Cage's prophecy. The challenges that Cage and others confronted during the second half of the twentieth century have similarities to those faced by music educators today. Not least of these is the need for us to face up to increasingly pluralistic models of musical production and consumption. There is a need for educators to fundamentally reconsider what is meant by musical ability, skill and understanding as ICT becomes incorporated in our classrooms.

### Extrinsic and Intrinsic Use: Two Models of Musical Practice with ICT

Within the classroom ICT can be used in at least two ways. They can function as tools to facilitate models of practice 'extrinsic' to the technology itself or they can be used to generate what might be called an 'intrinsic' model of practice, one that leads to a greater exploration and engagement with sound itself.

#### *The Extrinsic Model*

The first of these models is prevalent throughout the United Kingdom's classrooms. The most common and obvious outworking is the linking of musical keyboards to computer workstations using sequencing software as a tool for tonal composition. Typical compositional tasks might include working with melodic and rhythmic ostinati, chord-based compositions, writing music for film (occasionally incorporating the use of sound effects) and many other tonal-based, piano keyboard-mediated tasks. These tasks may provide valuable educational experiences for pupils. It is possible, and very likely in the hands of a skilful teacher, that these tasks will facilitate the development of their musical skills and understanding.

However, the use of the computer and musical keyboard in this way perpetuates musical concepts that have their roots in European music of the mid-18<sup>th</sup> century. Tonal music is a well-established tradition but has been challenged at various points by composers, working with and without new technologies, in fundamental ways as well as through the expanding access we all

have to world musical styles and traditions. Chanan describes the possible influences of new technology in the breakdown of tonality in the early twentieth century like this:

Is it an accident that over the same period as the introduction of the new technology of reproduction, music experienced a revolution in its every aspect? That figures like Debussy, Schoenberg, Berg, Webern, Bartok and Stravinsky turned it inside out and upside down, which not only left it utterly transformed but also became paradigmatic for the whole modernist movement? I hardly want to suggest that technology was the sufficient cause of this transformation, but neither is it neutral, or merely secondary to aesthetic and spiritual processes. (Chanan 1994, p.16)

For many of those composers named above the 'tools' of composition were the same as for previous generations, yet the wider sociological, technological and cultural changes within which they worked fundamentally affected their practice. But musical development cannot be described by reference to just one culture. Within a wider consideration of global musical practice, the 'musical traffic' (Swanwick 1988, p.110) runs in every conceivable direction. Swanwick lists geographical poles of musical traffic as well as transference between stylistic genres, to which one could add the deconstruction and recontextualisation of musical materials across boundaries of time and place via the Internet and through the development and use of recording and sampling mediums. So the prioritisation of certain musical qualities or attributes from a Western perspective has always been seen to be questionable by others. Our music education system needs to acknowledge this more readily.

This is important because music teachers have significant power in determining what counts as music within the classroom (Swanwick 1988, p.103). The shifting of power between formal and informal influences in the music curriculum (Green 2001) can lead to a fracturing of pupils' musical experiences inside and outside the classroom. Curriculum content and teaching style within music needs to react and respond to wider artistic and aesthetic issues. But the linking of a computer with a musical keyboard hinders a reconceptualisation, pre-empting discussion and argument about new ways forward. The interposition of an 18<sup>th</sup> century piece of technology (i.e. the equal-tempered keyboard) mediates at a fundamental level the type of musical activity that pupils can engage in. Unfortunately it also reinforces traditional concepts of success or failure within such an activity. The opportunity for using a computer as a musical instrument has been lost.

### *The Intrinsic Model*

The intrinsic model starts with a piece of ICT and examines it for its inherent musical possibilities. By way of an example, this section will focus on the opportunity of using a standard personal computer as a musical instrument.

Computers with sound editing or mixing software can facilitate a closer analysis of the micro-phenomena of sound in a way that is impossible to achieve in any other way. Like the skills exhibited by an advanced instrumentalist, who is able to mould and transform an instrument's sound through its highly technical and sophisticated physical interface, users of such pieces of

software can quickly get to the very core of sonic material and begin manipulating its structure through simple interfaces.

Electroacoustic composers produce music in this way. They are fascinated by a sound's inherent potential. The sound itself becomes the source for many new, as yet, undiscovered sounds through a process of exploration, a kind of sonic-sculpting via hardware and software interfaces. However, the impact of the technology goes beyond the practice of composition or performance. It results in a challenge to what constitutes music itself. Wishart's book (1996) documents many of these ideas at a philosophical level. He quotes the following definitions for 'music' from:

Music is sounds, sounds around us whether we're in or out of concert halls. (Wishart 1996, p.5 quoting Schaefer 1969, p.1)

to:

Computer-composed music involves composition, that is note-selection. (Wishart 1996, p.6 quoting Hiller 1981, p.7)

The first of these definitions is too broad, Wishart suggests, to be any use and the second too narrow to include even the most basic of electroacoustical processes. His discussion 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. It was this premise that underpinned that recent Sound2Picture project ([www.sound2picture.net](http://www.sound2picture.net)).

For many pupils musicality is caught up and defined by a notion of music performance and skill, nearly always related to a musical instrument. Ask your pupils who they think are musical and why? Typically answers may include, "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 rooted 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. But 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. This is where the intrinsic model is focussed.

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 as educational tools. 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.

To reiterate, ICT can be used as a tool to:

1. Facilitate models of practice extrinsic to the technology itself;
2. Generate an entirely new model of practice, one that is 'intrinsic' to the technology and that allows for a greater exploration of sound itself.

There is not a simple linear relationship between these models. Rather, teachers and pupils will traverse the boundaries of creative practice with ICT in many different ways. For example, as pupils and teachers use ICT under the intrinsic model they will need to draw on experiences from the extrinsic models and other types of musical learning without, ICT. To do otherwise is to fracture educational experience on a conceptual misnomer. Imaginative application of principles, models and methods is vital.

### How should we approach music teaching with ICT?

Music history and the sociology of music are seen as accessible only through the doors and windows of particular musical encounters. For it is only in these encounters that the possibilities exist to transform tones in tunes, tunes into forms and forms into significant life events. (Swanwick 1999, p. 45)

Swanwick's definition of musical encounter is well-established concept. Its clearest definition is found in *Music, Mind and Education* (Swanwick 1988) where he contrasts the notions of musical instruction against musical encounter (pp.120-138). Swanwick draws on the work of Bernstein (1971) to define instruction and encounter through the concept of framing and classification. Framing is:

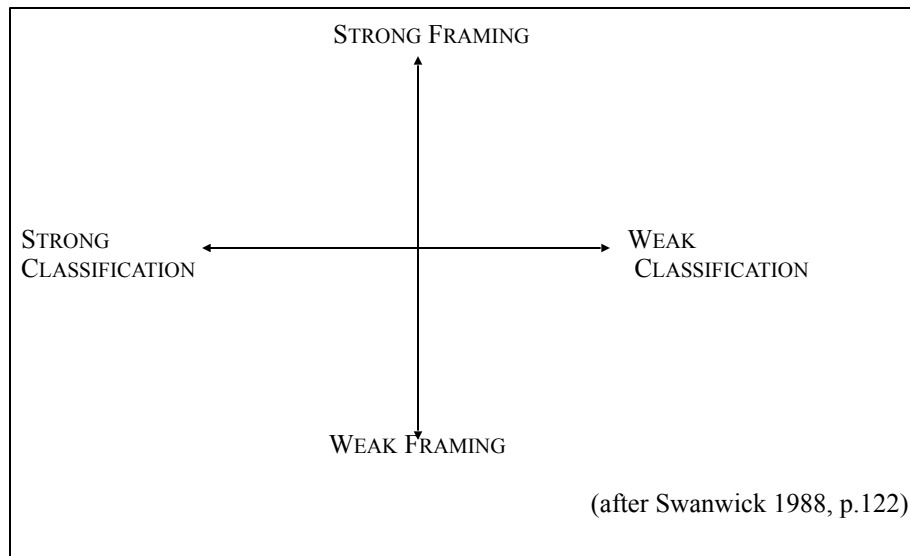
... to do with pedagogy, teaching style, with the degree of control that the teacher or student possesses over selection, organisation and pacing of what is to be learned. (Swanwick 1988, p.121)

When musical instruction is characterised by strong framing the teacher maintains control over the ways in which pupils learn. Swanwick suggests that weak framing, where most of the control of learning lies with the pupil, can result in an increased possibility of musical encounter. Linked with the concept of framing is the idea of classification. Classification is:

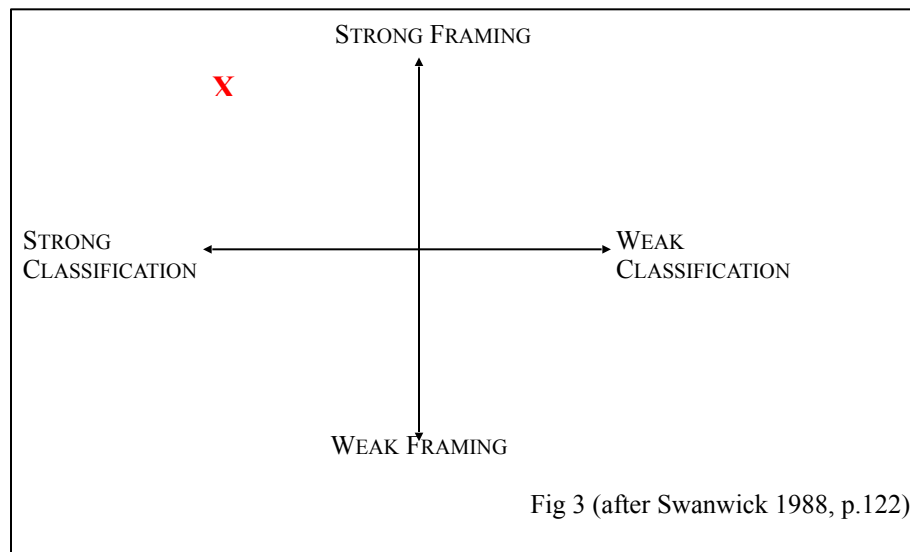
... to do with the exercise of selection over curriculum content, the way in which certain activities, perhaps 'subjects' are marked out for inclusion in or exclusion from the curriculum. (Swanwick 1988, p.121)

Strong classification is evidenced when teachers choose and fix rigid boundaries for what music might be studied in the classroom; weak classification gives power to pupils to decide the curriculum content.

Swanwick goes on to give a number of the permutations between the various combinations of strong and weak classification and framing. These can be documented on a simple graph:

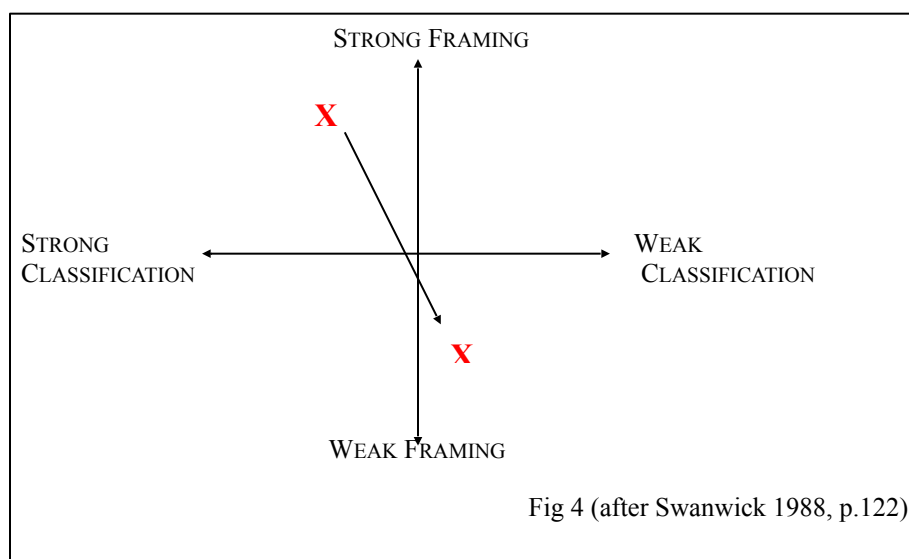


Within effective music teaching with ICT there will be a need for instruction, both musical and technological, e.g. when new technologies are introduced for the first time then a degree of familiarisation relating to their use and musical potential will be necessary. In most cases, this can be done speedily, allowing pupils the chance to explore the hardware or software for themselves once general guidelines had been put in place. On one occasion within the *Reflecting Others* project (Savage & Challis 2002), this introductory instructional phase was allowed to continue for too long. The explanation of a complex piece of video editing software was too detailed and lengthy and, although pupils were fascinated by the potential of the software and seemed keen to explore it for themselves, their chance to move from a position of strong classification and strong framing (teacher-led presentation of specific features of the software) to any other position on the graph was limited.



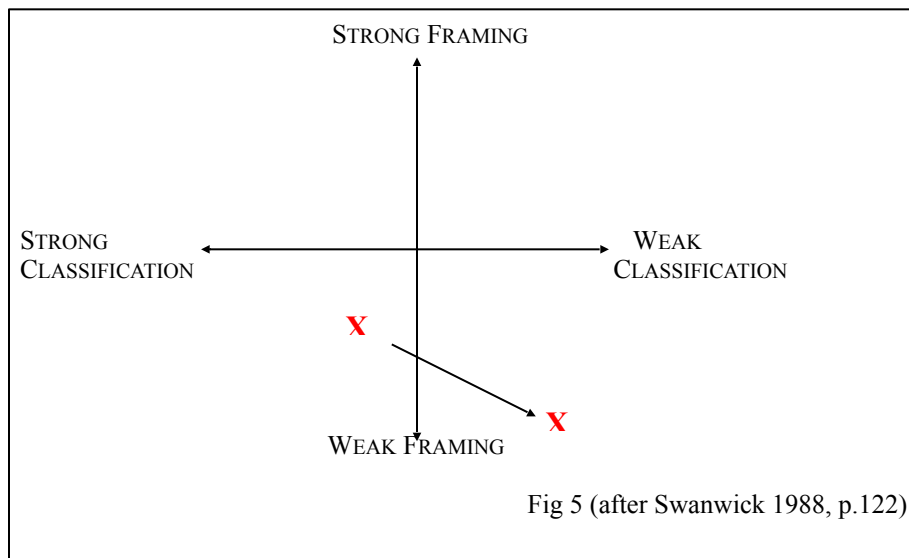


In a previous project (Savage & Challis 2001), pupils were introduced to the workings of a basic sound processor (Zoom 2004). These sessions were conducted using a variety of approaches. By adopting a position of strong classification and framing, the teacher chose which features of the sound processor to introduce to the class, doing so in a presentational style that allowed pupils little chance to explore the processor's other features. However, after this short presentation pupils were allowed to take away a sound processor and microphone and, within a small group context, explore both the demonstrated aspects of the sound processor and a range of other features that were easily discoverable. This was a move towards weaker framing and, although the classification level remained high, it did reduce slightly as pupils discovered new areas of knowledge for themselves.



More significant moves between classification and framing occurred when pupils began to use ICT within compositional tasks. In the *Dunwich Revisted* project (Savage & Challis, 2001) the use of support documentation played a crucial role. The *Dunwich Project: Sound Generation Sheet* (Appendix A) is one example. Within this part of the project pupils had to use a range of ICT to help in the production of basic sound ideas. Although the task was clearly defined, the ways in which pupils worked, the resources they chose to use and, most importantly, decisions relating to the actual material of the musical composition (its selection, manipulation, sequencing and structuring) were within their control. An example of the resulting work can be seen in the planning that pupils did for their composition work (see Appendix B). This represents a significant shift into areas of weak classification and framing. Although there the suggested way of working through the compositional process was clearly defined, there was flexibility within it to allow pupils to choose their musical ideas and develop their individual and group working practices.





### Doorways to Musical Encounters with ICT

Finding a ‘doorway in’ is an analogy designed to help teachers plan instruction to enable students to truly develop a structural understanding of music - an understanding that will empower their ability to listen to, perform, and create music, and enrich their capacity to understand what the music expresses. (Wiggins 2003)

The metaphor of doorways is a helpful way to consider how one might increase the possibility of our pupils experiencing ‘musical encounters’ through the effective use of ICT. The following section will focus on how these metaphors of encounter and doorways to consider how aspects of pedagogy and curriculum design are affected by the introduction of ICT in the music classroom.

*the presentation of appropriately integrated musical activities, classroom management, assessment.*

*In your planning, allow for flexibility and movement between categories*

Firstly, it is important to allow for and expect flexible movement between various classification and framing combinations during the course of individual lessons and throughout a scheme of work. Being too strong or weak in any one area for too long will lead to imbalances and pupil learning may be inhibited. The most successful moments in the use of ICT in music education are where when moves between strong and weak classification and framing are effected smoothly and in a way that does not disrupt pupils’ perceptions of the teaching style or approach that have been adopted.

*ICT can be a helpful differentiating tool to facilitate inclusion*

Secondly, when using ICT in music education it is important to be aware that individual pupil's experiences of pedagogical approaches will often be very different to what might have been expected or planned. For example, the supposed freedom of a weakly framed and classified composition task could be meant to be beneficial, liberating and a creative opportunity for some pupils. But for others the very freedom of the task might become the problem. The need for additional support or instruction (a move towards stronger framing but not classification) would be in important to complete the task effectively.

*Moves towards intrinsic approaches to ICT are helped by carefully worded learning objectives*

Thirdly, ICT presents increased opportunities for musical encounters when teachers are confident to phrase learning objectives in such a way that allows for major shifts in classification and framing. Wiggins' work in this area is particularly fascinating. Her metaphor of a 'doorway in' to musical encounter captures the essence of this point. The teacher's role is to phrase particular learning objectives in such a way that the particular doorway will capture pupils' imaginations and cause them to pass through it into a realm of creative possibilities:

It is an image to help teachers choose music from which to teach, and create lessons that will maximize student understanding of the music and of the ways in which music operates. (Wiggins 2003)

So at one level within this metaphor there is an element of strong classification. But the nature of the creative process allows them to make vital choices about the essence or materials of music:

The very nature of creative process necessitates the manipulation of all the elements of music. Students cannot create a work without making decisions about virtually all of the structural elements. (Wiggins 2003)

*The use of ICT will redefine what counts as music*

Wiggins' beliefs about the careful selection of musical content and diligent planning are central to effective music teaching. However, certain models of classification may need redefining as teachers and pupils discover the creative potential of new technologies. Whilst it may be perfectly legitimate to use ICT to reinforce existing musical styles and practices, in the intrinsic model pupils can use ICT to produce music of an eclectic style, defined not by their teacher's pre-classification of musical content but by their own investigation, selection and manipulation of new sound sources. As far as was practically and theoretically possible, they can be given the opportunity to explore new musical landscapes through an ICT compositional doorway.

### *The efficiency of ICT*

Fifthly, ICT allows pupils to generate, explore and refine musical ideas with a speed of discovery that is beyond that achieved by conventional approaches. This is undoubtedly a motivational factor for pupils. Pupils will almost certainly produce too many musical ideas and will have to be taught the value of editing, synthesising and combining ideas. But this is an important part of many composers' compositional processes (Savage 2005). Breadth of discovery needs to be matched by a depth of enquiry and engagement with sound materials.

### *ICT will demand new approaches to assessment*

One of the largest changes brought about through the use of ICT in the music classroom is in relation to the procedures for assessing pupils' work. The key point relates to classification and framing. The explicit or implicit learning pathways within pieces of ICT can compensate for what might seem like weak framing or classification from a teaching perspective. A vital part of assessment is recognising the classificatory or framing effect of ICT on the pupils' creative work and to discuss with the pupil the effect of this on their working process with the piece of technology (Savage 2002).

### *ICT helps teaching music in an integrated way*

Finally, the use of ICT should facilitate a teaching style that allows for the integration of the curriculum elements of performing, composing, listening and appraising. This is the most important theme in the National Curriculum documentation. Central to this is the demand to 'ensure that listening, applying knowledge and understanding, are developed through the interrelated themes skills of performing, composing and appraising' (DfEE 1999, p.20). Ultimately, the integration of performing, composition, listening and appraising is only modelled on authentic musical practices.

### Conclusion

The development of computer technology has suggested to many that the computer can become a technology of unparalleled importance in the arts. What does such a vision imply for the creation of school programs in the arts? What does a computer allow students to do with images that other technologies don't, and what might such a resource mean for the development of cognitive skills? (Eisner 2002, p.41)

Eisner's challenge to art educators translates to music educators with equal relevance and force. Important decisions will need to be made about the future purpose and practice of music education in light of this technological revolution. But for many the focus has been elsewhere:

For many schools the main focus of activity following installation of networked ICT infrastructure was on teaching ICT skills. Cross-curricular use of ICT is difficult for secondary schools to achieve because ICT has traditionally been a

specialist subject for GCSE. *A major shift in culture and established practice is involved in the introduction of ICT within subject teaching.* [my italics] (DfES 2002, p.19)

Eisner's comments about the potential and challenge of the computer come in a chapter entitled 'Visions and Versions of Arts Education' which seeks to describe some of the common aims and content of arts education programs common in schools today. He states clearly that there is no 'sacrosanct vision of the aims of arts education' and that 'examples of diversity abound' (Eisner 2002, p.25). However, his summary of the five principles of arts education can be useful starting points to explain the application of new technologies to the music curriculum.

### 1. Music education should give pride of place to what is distinctive about the contemporary musical practice

The use of ICT in both intrinsic and extrinsic models address a range of musical and technological skills that widen the opportunity for pupils to engage in music beyond music education's traditional approaches. For these reasons, if nothing else, ICT should continue to have a central role in music teaching and learning.

### 2. Music education programs should try to foster the growth of musical intelligence

Ability in art is assigned to talent; ability in 'intellectual subjects' is assigned to intelligence. (Eisner 2002, p.43)

Intelligence takes many forms. The use of ICT exhibits peculiar forms of artistic and musical intelligence within the cultural context of the classroom. Intelligent evaluation and reflection on the process of creation should be a common theme in all musical work with new technologies. Intelligence belongs to the music just as much as to any other part of the curriculum.

### 3. Music education programs with ICT should teach how to create and experience the aesthetic

Eisner's suggestion is that within curriculum development the arts 'can, and probably in most situations will, be addressed in an integrated fashion' (Eisner 2002, pp.43-44). Sound2Picture ([www.sound2picture.net](http://www.sound2picture.net)) showed that sound design allowed pupils to jointly consider aspects of visual and musical significance and investigate their relationships within the digital medium. Within the digital medium pupils have now got another opportunity to create and experience the aesthetic if music teachers are willing to broaden their approaches and, on occasions, work through an integrated model of arts education.

4. Music education should help pupils recognise what is personal, distinctive and unique about themselves

Personal responses are the key to all arts education. A pupil's personal response to a piece of music, a song or a movie is the key to their own creative work. Starting points are vital in achieving depth and quality in this kind of work. Creating educational situations in which pupils can imbue their personality, character and creative spirit is the key for teachers. The curriculum framework of creative ideas for the use of ICT in the classroom is as, if not more, important than the pieces of technology themselves. At the end of the day, ICT is just another creative tool (albeit a very powerful one).

5. Art education programs should make special efforts to enable pupils to secure aesthetic forms of experience in everyday life

Each subject studied in schools affords the student a distinctive window or frame through which the world can be viewed. (Eisner 2002, p.45)

Finally, Eisner draws attention to the larger issues that arts educators hopes to address, i.e. facilitating in pupils an appreciation of the wider world as a rich source of meaning when viewed within an aesthetic frame of reference. This is a lofty ideal to which no single curriculum resource or teaching approach can claim exclusive rights. But the creative use of ICT will help educators achieve this end.

Finally, there is a strong argument for teachers to respond to the natural pull of digital technologies towards the digital arts (Sefton-Green 1999). The creative use of ICT can, and perhaps should, resituate musical practices within the world of the digital arts. An integrated arts or multimedia approach to musical performance and composition with ICT may engage and motivate pupils more successfully, facilitate the development of their creative skills and bring about a greater sense of personal aesthetic awareness. Perhaps this is where the future of music education is heading?

4963 words

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