

The Door is Now Open to Learn How to Speak ...

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. (Lachlan Young 2003)

Introduction

An Historical Perspective on ICT

Thinking about new technologies and how to incorporate them into musical practice is not a new problem. Consider the following statements:

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)

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

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. Stokowski recognised the transformation of all aspects of musical practice that might be the result of a creative and aesthetic use of new technologies. And Varese summarised 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 in Schwartz & Childs 1967, p.197)

The revolution in musical technologies that we have witnessed 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, with the possibility to fulfil some of the prophecies made above within the realm of music education. These statements provide a useful backdrop to the opening of this chapter that seeks to develop ideas about how we can plan for the effective use of new technologies in our teaching. For in many respects, 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 diverse models of musical production and consumption. We need to reconsider at a fundamental level what is meant by musical

ability, skill and understanding and how these can best be taught and nurtured within our classrooms. A failure to do this will almost certainly lead to pupils developing their musical skills elsewhere.

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 Facilitating Power of ICT

The first of these models is prevalent throughout the United Kingdom’s classrooms. Practically, the most common and obvious outworking is the linking of musical keyboards to computer workstations. The simplest use of sequencing software is as a tool for tonal composition and, at a conceptual level, this is where many teachers are happiest working. 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 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 is perpetuating musical models that have their roots in the mid-18th century. Tonal music is a well-established tradition in the Western world but has been challenged at various points by composers, working with and without new technologies, in fundamental ways. 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 transfer between stylistic genres, to which one could add the deconstruction

and recontextualisation of musical materials across time boundaries 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.

We can all appreciate that much great music has resulted from the tradition of Western Classical art music. But whilst new technologies are facilitating a re-conceptualisation of artistic practice in the wider world many are engaged in a non-questionable use of technology to reinforce traditional musical practices and priorities. Yet even this is not really a new issue. Many writers have commented on the slow pace of change within 'formal' music education in other respects, such as the integration of world music or popular music within the curriculum (Green 1988 & 2001, Kwami 1989, Nwezi 1999).

The Revolutionary Power of ICT

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 the arts 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 18th 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 revolutionary tool has been lost.

The ImpaCT2 project (DfES 2002) reflected on these issues at a general policy level. A key finding from this report stated that:

The arrival of networked ICT placed great demands on schools and teachers and it is taking time to embed it in teaching and learning practices. ... This innovation has progressed in three stages: during stage one the main focus is on the provision of equipment infrastructure and support; stage two focuses on teaching ICT skills, often in specialist ICT lessons; stage three moves to the integration of ICT with curriculum subjects, including numeracy and literacy. (DfES 2002, p.3)

During the time of the report only a few schools seemed to have moved effectively into stage three. Why?

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)

This final sentence summed up precisely where the potential problems of adopting an intrinsic model of ICT lie. Truly artistic uses of networked technologies within schools are very rare. Within music and arts education there are many strong and established practices that often resist the development of ICT in ways that seek to transform the subject itself. To truly embrace such a vision of ICT does require a major shift in one's own subject culture and established practices.

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. As pupils and teachers use ICT in a way that is intrinsic to their musical practice they will need to draw on experiences from any other models and types of musical learning with, or without, ICT. To do otherwise is to fracture educational experience on a conceptual misnomer. Imaginative application of principles, processes and methods is vital.

I am reminded that the transition from acoustic instruments to digital ones, *mutatis mutandis*, has not included a corresponding transition from acoustic to digital music. What has necessarily been a search for a new instrument should now mandate a search for a new music *endemic* to its nature. That is: *computer music*. (Gaburo 1985, p.43; [emphasis in the original])

Gaburo overstates his case by adopting a modernist argument that creates artificial divides between musical styles, separating them from previous forms in a claim for originality. However, when considering the use of ICT in music education one all too often finds a situation similar to that outlined above. For some there is a reluctance to move beyond the familiar world of acoustic instruments and their accumulated sensibilities to a digital age. For others, there is an embracing of the new but in an approach that reinforces and perpetuates past ways of teaching and learning. And some may claim to abandon the past completely! But all of us, at various times, find ourselves moving between these categories.

Having outlined some introductory issues, this chapter will continue by considering three key questions:

1. What is effective musical teaching with ICT?
2. How can we maximise the opportunities for pupils to develop musically with ICT?
3. What type of 'revolution' could or should ICT have on our music practices and priorities?

What is Effective Music Teaching with ICT?

Swanwick (1999, p.45) develops an eloquent argument about the nature of musical expression and our roles as educators in seeking to promote and develop our pupils' musical understanding. He describes three main principles that should characterise 'musical' music teaching and can be usefully applied to a definition of what makes effective musical teaching with ICT. These three principles are:

1. Care for music as discourse;
2. Care for the musical discourse of students;
3. Fluency first and last.

These three principles will frame the forthcoming discussion of what effective music teaching with ICT might look like.

1. Care for Music as Discourse

The particular teaching method is nowhere near so important as our perception of what music is and what it does. Running alongside any system or way of working will be the ultimate question – is this really *musical*? (Swanwick 1999, p. 45)

Pupils' work with ICT in both the extrinsic and intrinsic models can be musical! We may be more familiar with their work in the extrinsic model, but working with pupils and ICT within music education is about charting that new discourse of musically rich possibilities that the intrinsic model suggests. Swanwick goes on to discuss practical approaches that help illuminate and justify pupils' musical encounters. The careful use of performance skills, factual knowledge, points of musical history and analysis can all work alongside pupils' direct musical experiences with ICT to produce meaningful, rich and personal musical encounters.

Care for music as discourse places a responsibility on us to understand what a particular 'musical discourse' is. When teachers work within the extrinsic model of ICT-enriched music education, the path of musical discourse is relatively clearly laid out. Many teachers are secure in their knowledge and pedagogy when it comes to particular parts of the music curriculum such as Western Art music, world and popular musical styles. However, this has not always been the case. Green (1988) describes a time when popular music had little standing or recognition within the formal music curriculum and the struggles that teachers had to face to broaden their knowledge in this important area. Similarly, her recent book (Green 2001) examines the pedagogy of popular musicians and challenges teachers to rethink their classroom pedagogy through the incorporation of informal learning pedagogies.

The case that Green made for popular music in the curriculum in 1988, and her careful consideration of the learning styles of popular musicians in 2001, have important similarities to the situation facing many music teachers in respect of the adoption of ICT in their teaching. We will need to extend and develop our subject knowledge in this area and develop an appropriate pedagogy to accompany an intrinsic model of ICT-enriched

music education. One key strategy in accomplishing this could be the careful study of music ICT ‘experts, charting their working practices and, most importantly, their musical discourse. As we begin to understand the changing nature of musical language brought about by the incorporation of ICT into performance and composition, our understanding of the means by which this educational change can occur will strengthen too. We can begin to imagine how ICT can truly transform music education into an inclusive activity, albeit with a range of new skills, rather than solely perpetuate existing models.

2. Engagement with pupils’ musical discourses

Discourse – musical conversation – by definition can never be a monologue. Each student brings a realm of musical understanding into our educational institutions. We do not introduce them to music, they are already well acquainted with it. (Swanwick 1999, p.53)

One problem we face is that our pupils will not wait around for us to embrace the potential (and pitfalls) of ICT in our teaching. Whilst we are debating the pros and cons of developing our knowledge of appropriate ICT-facilitated musical discourses, pupils are eating their Chocolate Shreddies and playing with free powerful pieces of music software (Fig.1).

Acknowledging where pupils are at is an important component of any effective teaching pedagogy. Pupils are already well acquainted with music, or a least a particular type of music. Bruner’s notion of folk pedagogy reinforces this point and emphasises the importance of understanding the potential conflicts that can erupt within a classroom if one is insensitive as a teacher to pupils’ prior experiences:

You had better take into account the folk theories that those engaged in teaching and learning already have. For any innovations that you, as a “proper” pedagogical theorist, may wish to introduce will have to compete with, replace, or otherwise modify the folk theories that already guide both teachers and pupils. (Bruner 1996, p.46)

Creating and maintaining an opportunity for musical discourse between pupils and teachers is a vital consideration as we seek to implement ICT effectively in our classrooms. We know that many pupils bring with them a wide range of musical knowledge and practice into the classroom. Many of us are firm believers that the majority of these pupils love music and the role it plays in their lives. Yet for some, the formalisation of music within the curriculum squeezes the vibrancy and excitement out of it. It becomes monotonous and divorced from their lived or felt experience of music outside the classroom context.

In all cases, teachers can seek to build on pupils’ latent interest in new technologies as tools for learning, opportunities for recreation and means of communication. Pupils will make increasing use of the many free and inspiring resources available via the Internet to develop their range of musical skills and expression. We need to be aware that the significance of musical education inside the classroom may decrease for some pupils if

they turn to more stimulating and engaging opportunities for musical learning outside the classroom.

3. Fluency first and last

Musical fluency takes precedence over musical literacy. It is precisely fluency, the aural ability to imagine music coupled with the skill of handling an instrument (or the voice), that characterizes jazz, Indian music, rock music, music for steel-pans, a great deal of computer-assisted music and folk music anywhere in the world. (Swanwick 1999, p.56)

Swanwick's idea of musical fluency taking precedence over musical literacy is a helpful extension within the ICT debate. We should seek a much broader definition of musical literacy than that solely related to staff notation. This is what Swanwick is driving at in his definition of 'musical' music teaching. It reinforces what we know to be true from our observations of composers working with computers and other technologies in studios settings (Savage 2003). Swanwick's prescription of fluency being dialectical, a combination of imagination and skill is precisely right when it comes down to a consideration of musical practice with ICT. Sometimes it is the musical imagination that fires the composer into action and leads them on a road of discovery through their studio equipment; in other situations it is their skilful play within the software or hardware environment that inspires the imagination onwards through the composition process. Either way, imagination and skill are vital parts of musical fluency with ICT and are intricately related within the process of creation.

Maximising Opportunities for Learning: Doorways to musical encounters with ICT

Music history and the sociology of music are seen as accessible only through the doors and windows of particular musical encounters. (Swanwick 1999, p.45)

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 discussion will focus on these metaphors of encounter and doorways as we consider how aspects of pedagogy and curriculum design are affected by the introduction of ICT in the music classroom.

Swanwick's definition of musical encounter is a long established concept in music education. 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. 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)

Musical instruction is characterised by strong framing, the teacher maintaining 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. This relates to the selection of curriculum content and, like framing, is expressed in terms of strength and weakness. Strong classification is evidenced when teachers choose and fix rigid boundaries for the musical content to be studied in the classroom; weak classification gives power to pupils to decide the curriculum content.

So how does a consideration of classification and framing help us consider the effective use of ICT in the music classroom?

1. Designing Doorways for Musical Encounters

ICT can present increased opportunities for musical encounters if a teacher is prepared to let go of strong 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. In her view, the teacher's role is to find the particular doorway that will capture pupils' imaginations and cause them to pass through that doorway 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 once pupils have gone through the teacher-constructed doorway the nature of the creative process allows them to make vital choices about the essence or materials of music (particularly so with digital technologies):

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)

Ultimately, as Wiggins admits, this all comes down to good planning:

If you plan your lessons so that students have opportunities to create original music, they will become more and more proficient at operating within music

systems and come to know the greater complexities of music in general.
(Wiggins 2003)

Wiggins' belief is that the careful selection of musical content and diligent planning are central to all effective music teaching, but especially so with ICT.

2. Flexibility in Teaching Style

As a teacher 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 a pedagogical imbalance and pupil learning may be inhibited. The most successful approaches to the use of ICT in the classroom move smoothly between strong and weak classification and framing in a way that does not disrupt pupils' perceptions of the teaching style or approach being adopted.

3. Understanding Pupils Perceptions of Teaching Style

Individual pupils' experiences of these various pedagogical approaches are often very different to what one might expect and plan. For example, the supposed freedom of a weakly framed and classified composition task with ICT may be designed to be beneficial, liberating and a creative opportunity. For many pupils this may be the case but for others the very freedom of the task becomes the problem. Additional support or instruction (a move towards stronger framing but not classification) may be needed in order to assist them complete the tasks effectively. This support could be provided within the ICT or through traditional methods (teacher intervention, peer assistance, support materials, etc).

4. Redefining Teaching Styles with ICT

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 (the extrinsic model), often pupils can use ICT to produce music of an eclectic style, defined not by pre-classification of musical content but by their investigation, selection and manipulation of new sound sources (an intrinsic model). At a general level, pupils can explore musical styles within which their knowledge may be limited at the outset. But as far as practically and theoretically possible, they should be encouraged to explore new musical landscapes through ICT compositional doorways.

5. Increasing Musical Fluency with ICT

ICT can allow pupils to generate, explore and refine musical ideas with a speed of discovery that may not be possible with other methods. In the early stages of any ICT innovation there is undoubtedly a motivational factor for pupils. But in order to sustain

this motivation they need to understand how ICT can play an ongoing part in their musical activity, e.g. compositional processes need to be made clear and the various stages of work within a particular task exemplified. Breadth of discovery needs to be matched by a depth of enquiry and engagement with sound materials to assist the development of musical fluency (Savage & Challis 2001 & 2002).

6. Changes Styles of 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 implications of this change have been thoroughly discussed elsewhere (NAME 2002). But there is a key point to mention here in relation 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 and documenting the classificatory or framing effect of ICT on the pupils' working process.

7. Integration

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 our current National Curriculum documentation. Do we find working within 'confines' of the National Curriculum a restricting experience? Even if we work with ICT at what Kushner calls the 'fringes of music education' (Kushner 1999) we should feel secure that we are working within the 'Knowledge and Understanding' statements of the Key Stage 3 curriculum. 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. Hence one could agree with Wiggins that:

Providing students opportunities to become intimately involved with the pieces they listen to, perform, and create enables them to develop a broader and deeper understanding of the ways in which music 'works'. This greatly enhances their opportunities for understanding what music communicates. (Wiggins 2003)

Conclusion: What type of 'revolution' should ICT have on our music teaching and learning?

Three points will be made to teachers and teacher trainers by way of conclusion. Firstly, we 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. We will need to:

1. Be ready to embrace change and respond to the new challenges of ICT year by year;
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 chapter;
5. Respond to the intrinsic pull of these technologies towards the digital arts (Sefton-Green 1999). We should make closer links across the arts with a naturalness and technological awareness that is seldom evident at the present time.

ICT can bridge the gap between what are often our disparate artistic practices within schools. Perhaps this will demand that we reconceptualise the National Curriculum in various ways, strengthening the process of musical creation alongside the wider performing and visual arts and then linking together with other artists and subject areas within our schools. Politically, of course, there are issues surrounding each of these areas that this chapter has not had space to address. Teachers need more time, space and appropriately differentiated systems of support in order to make progress in these crucial areas.

Secondly, those involved in educational research should remember that teachers are in the best place to examine and reflect on approaches towards educational change with ICT. The methodologies of case study and action research provide ideal tools for teachers to give accounts of events in their classroom and think through issues that facilitated change in their own practice. Sharing these stories, perhaps in a multimedia context (Walker 2002), is an essential way forward.

Finally, those involved in teacher education have a crucial role to play in preparing trainee teachers for full, satisfying and enriching careers as teachers. 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 and the policy makers who shape the nature of their training.

This chapter has attempted to give an outline of ideas for those interested in developing their pedagogy with ICT. This writer remains convinced that ICT, composition and practitioner-based research should be at the heart of music education. There is still an increasing need amongst practitioners for debate at a deeper level about each of these areas. In that sense, this book is just a starting point. Let the debate continue! “The door is now open to learn how to speak”.

References

BERNSTEIN, B. (1971) ‘On the Classification and Framing of Knowledge’ in YOUNG, M. (ed.) *Knowledge and Control* London, Macmillan.

BRUNER, J. (1996) *The Culture of Education* Cambridge, Mass. & London, Harvard University Press.

CAGE, J. (1968a) *Silence* Cambridge, Massachusetts, M.I.T.

CHANAN, M. (1994) *Musica Practica: The social practice of Western Music from Gregorian Chant to Postmodernism* London & New York, Verso.

DEPARTMENT FOR EDUCATION AND EMPLOYMENT (DFEE) (1999) *National Curriculum for Music 2000* London, DfEE.

DEPARTMENT FOR EDUCATION AND SKILLS (DFES) (2002) *Pupils' and Teachers' Perceptions of ICT in the Home, School and Community* London, DfES.

GREEN, L. (1988) *Music on Deaf Ears: Musical meaning, ideology and education* Manchester, Manchester University Press.

GREEN, L. (2001) *How Popular Musicians Learn: A way ahead for music education* Aldershot, Ashgate.

KUSHNER, S. (1999) 'Fringe Benefits: music education out of the National Curriculum', *Music Education Research*, 1:2, pp. 209-218.

KWAMI, R. (1989) 'African Music, Education and the School Curriculum' Unpublished Ph.D thesis, London University Institute of Education.

LACHLAN YOUNG, M. (2003) *Found Sound CDRom* www.foundsound.org

NAME (2002) *How Are You Doing? Learning and assessment in music* Matlock, NAME.

NWEZI, M. (1999) 'Strategies for Music Education in Africa: Towards a meaningful progression from traditional to modern' *International Journal of Music Education* 33, pp.72-87.

SAVAGE, J. & CHALLIS, M. (2001) 'Dunwich Revisited: Collaborative composition and performance with new technologies' *British Journal of Music Education* 18:2, pp.139-149.

SAVAGE, J. & CHALLIS, M. (2002) 'A Digital Arts Curriculum? Practical ways forward' *Music Education Research* 4:1, pp.7-24.

SAVAGE, J. (2003) 'Informal Approaches to the Development of Young People's Composition Skills' *Music Education Research* 5:1, pp.81-85.

SEFTON-GREEN, J. (1999) (ed.) *Young People, Creativity and New Technologies: The challenge of the digital arts* London, Routledge.

STOKOWSKI, L. (1932) Address to the Acoustical Society of America (<http://asa.aip.org/>)

SWANWICK, K. (1988) *Music, Mind and Education* London, Routledge.

SWANWICK, K. (1999) *Teaching Music Musically* London, Routledge.

VARESE, E. 'The Liberation of Sound' in Schwartz, E. & Childs, B. (eds.) (1967) *Contemporary Composers on Contemporary Music* New York, Holt, Rinehart & Winston.

WALKER, R. (2002) 'Case Study, Case Records and Multimedia' *Cambridge Journal of Education* 32:1, pp.109-127.

WIGGINS, J. (2003) Handout from the East Anglian Researchers (EARS) meeting at Homerton College, University of Cambridge.

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