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New Technology in the Classroom. A Plea for the Creative Use of Electronic Resources

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NEW TECHNOLOGY IN THE CLASSROOM

Paul Wright discusses ways of handling sound and structure

Arguably the most profound change in the musical culture of this century has been the development and spread of sound recording. Indeed the soundscapes of the recording studio have become such a familiar part of everyday experience that most of us take them for granted. None more so than the young, many of whom, since the arrival of cheap consumer electronics, have had their first experience of practical music making through some form of recorded or synthesized sound. All this is particularly significant here in Britain, which is a major centre of the recording industry and renowned worldwide in the spheres of serious (electroacoustic) and popular (rock) music making.

Few would now doubt that music technology can make a major contribution to performing, composing and developing aural sensitivity. While performers and composers who use the medium regularly offer particular insights. For

example: the perception that all sound is capable of becoming musical material, whether from traditional instruments, from our everyday environment, or produced electronically; or the progressive discovery that the means to capture and generate sound and explore its expressive potential is available in totally new ways. Moreover, through new technology the opportunity to develop musical material and make artistic judgements about structuring compositions is becoming widely accessible, even to those with little formal training in traditional musical skills. Already these insights, derived from electroacoustic music making, are being assimilated into general musical experience across a wide range of styles.

Not surprisingly, therefore, items of music technology are finding their way into schools at an ever-increasing pace, the latest tools in a tradition of practical classroom music making going back to the gamelan-derived Orff instruments found in British schools from the late sixties. But unlike the latter, which were purpose built for the classroom and came supported by a teaching culture from Carl Orff, today's classroom technology is being piped in under pressure from the music industry, pupils, parents and governors, with little opportunity for serious thought about implications for the music curriculum.

The available equipment, too, is generally unsuitable for the classroom, designed mainly for the domestic market with the solitary hobbyist in mind.

Teachers have responded variously to the dilemma. Many are attempting to find a middle way between the extremes of banishing acoustic sounds from the classroom in favour of electronic keyboards with factory preset sounds; or of continuing traditional approaches for the majority while singling out individuals and small groups to work on a closed system consisting of a com-



puter sequencer and a multitimbral keyboard. Attempts have been made by some local authorities, or software houses, to provide teaching aids for keyboards and educational software for personal computers; and many authorities have (or had) Advisory Teachers for Information Technology in Music. But there is evidence to suggest that the latter may have tended, despite their best efforts, to widen a gulf between music making with electronic instruments and acoustic sound sources. Too few teachers or local authority advisers seem to be aware of the creative possibilities of music technology or of the tradition of electro-acoustic composition and performance, particularly strong here in Britain.

A music curriculum which attempts to integrate the new music technology with acoustic instruments and voices must begin with sound itself. The tools of music teaching are those which allow children to explore sounds and structure them expressively. From an early age children find the most excitement in composing when they are able to build simple compositions from raw materials, experimenting with sound sources, controlling and shaping material directly, like a potter with clay. At Key Stage One (pupils aged 5-7 years) of the National Curriculum, a microphone, a cassette recorder and loudspeakers offer children the opportunity to extend their investigation of 'a range of sound sources including their voices, bodies, sounds from the environment and instruments, tuned and untuned'. (Programme of Study viii; Music in the National Curriculum, Key Stage One, p.8.) The addition of an inexpensive signal, or 'sound' processor enables children to alter sounds, for example, by elongating them using 'digital reverberation', or repeating them using 'echo' or 'delay'. As their experience grows in Key Stage Two, more radical transformations can be handled, such as reversing the sound or adding a progressive pitch change to echo ('pitch shift'). These transformed sounds may then be recorded and used alongside instruments or voices in composition, or added live in performance, creating new and exciting timbres and textures.

These activities focus childrens' listening, encouraging them to find words and graphic symbols to help them discriminate between sounds, and make simple choices about their expressive use. (See National Curriculum: Key Stage One.)

In the years between seven and eleven, as well as gaining experience of creating and using a range of original sound materials from synthesized and recorded sources, the National Curriculum requires pupils to 'devise and develop musical ideas within simple structures'. Traditional approaches can be complemented by the use of electronic mixing and editing, using a four-track cassette recorder, or a simple computer based sequencer alongside live instruments and voices.

Unfortunately many of the computer software packages available for schools have a tendency to draw children away from group music making into the virtual reality of the computer environment. One programme, *Designing Sound*, from the National Council for Educational Technology, which works in conjunction with an existing range of small multitimbral keyboards, shows the way forward. By moving a coloured trace across a screen children explore original and often richly complex timbres drawn from the synthesizer. These evocative sounds, avail-

able for further exploration and performance on the keyboard, stimulate children into group activity with voices and instruments, and collaborative work with dance and drama.

In improvisation, composition or performance, the use of faders and tone controls on electronic equipment enables children to have sensitive control over dynamics, timbre and texture, developing listening skills in ways unimaginable in any other learning context.

The practice of teaching music to whole classes in the first three years of the secondary school seems set to continue. Integration of technology at this phase should stem from the same desire to offer direct and tactile means to handle sound and structure. The established strategy of dividing whole classes between work areas allows items of technology to be deployed according to their composing or performing enablement alongside classroom instruments and a range of acoustic sound sources. Within such an environment, samplers, synthesizers and sound processors greatly extend traditional ways for pupils 'to control a wide range of sound sources and make increasing use of more sophisticated instruments' (National Curriculum: Key Stage 3); multitrack recorders and sophisticated computer based sequencers store and retrieve material, allowing pupils to 'refine their work to produce complete compositions' (Ibid); MIDI (Musical Instrument Digital Interface) and tape-to-digital time coding can be employed to make still more flexible and imaginative use of electronic resources.

Sound diffusion using a sophisticated loudspeaker system, common in professional performance, is one of the most exciting aspects of the new technology not yet to have found a place in schools. Arts education initiatives have shown that quite young children grasp the principles of sound diffusion readily, and derive enormous enjoyment and benefit from performing their own music in this way. A small loudspeaker rig and diffusion mixing desk are now within reach for many schools.

Creative use of music technology in schools is still in its infancy. Human imagination is the only factor to limit its power to combine the new and the old in undreamt of worlds of sound and depths of expression. Initiatives which still need to be taken or greatly extended include:

- (i) the commercial development of hardware and software specifically designed for the classroom. This needs to be supported by research into how children interact with music technology as a creative resource, across all learning ability.
- (ii) the commissioning of classroom teaching materials which offer teachers examples of integrated work.
- (iii) a serious commitment by schools and public funding bodies to arts initiatives enabling the work of professional composers to find expression in the classroom.
- (iv) the commissioning of works for conventional instruments and live electronics within the technical reach of young performers and the equipment resource of schools.
- (v) the provision of a National Centre for Electronic Music which can focus these activities, co-ordinate outreach programmes and promote a development of regional centres.

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