

MUSIC AND ICT IN THE PRIMARY CLASSROOM: COMPOSITION WITH DANCE EJAY

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ABSTRACT

This paper draws on results of an ESRC research project which focuses on the use of new technologies in educational settings to enhance learning. In this paper I will examine the first experiences of two non-specialist Primary teachers within the same school, using Dance eJay software within a Year 6 scheme of work based around composition. I will consider the impact that this technology had on the students, looking closely at the way in which these non-specialist teachers orchestrated the lessons and developed a constructive learning environment for the students.

INTRODUCTION

This paper draws on results of an ESRC research project which focuses on the use of new technologies in educational settings to enhance learning (www.interactiveeducation.ac.uk). The project draws on a range of theoretical perspectives with a particular focus on socio cultural theory and its emphasis on the crucial role which communication through language and other semiotic systems play in learning (Wertsch, 1991). Crook (1994) writing about the use of new technologies in educational settings, highlights the importance of communication within the classroom - between the students themselves as well as between the teacher and the pupils. Davis, Sumara & Luce-Kapler (2000) further stress the crucial role of the teacher in supporting learning:

...the path of learning can never be determined by the teacher. However the path of learning is dependent on the teacher – along with a host of other contingencies.

Recent research in students' out-of-school learning (Facer, 2001) suggests that pupils' experiences of technology outside school equip them with competencies that they use and build upon within the classroom. Sefton-Green (2000) argues that young people are highly involved in electronically mediated experiences in their lives out of school, both as consumers and creators, and suggests that digital technologies associated with music and the media actually offer opportunities for communicating, disseminating and making culture.

In this paper, the examination of Dance eJay as a new medium for learning music, will be considered within these social contexts.

APPROACH TO RESEARCH

The research reported in this paper forms part of the ESRC Interactive Education Project at Bristol University (www.interactiveeducation.ac.uk) which is examining the ways in which technologies can be used in educational settings to enhance learning in seven subject areas and in special needs. The project involves work with teachers in 7 curriculum subjects (English, geography, history, mathematics, modern foreign languages, music and science) from 9 institutions – 3 primary, 5 secondary and 1 tertiary college.

The music team consists of 8 teachers (3 from primary schools and 5 from secondary schools) and two researchers (Breeze and Gall). Work centres around the design and evaluation of ‘subject design initiatives’ which are developed by collaborative partnerships of teachers, teacher educators and researchers within subject teams. For their initiative, teachers were asked to focus on an area of the curriculum which pupils normally find difficult and that could possibly be enhanced by the use of ICT to support learning.

Since June 2001, the teachers have been working alone, individually and as a school team with the researchers, and as a full team. Design of initiatives was informed in an iterative way by teacher’s craft knowledge, the research team’s expertise, theory and research-based evidence on the use of computers for learning. At the beginning of work, all teachers were interviewed individually to give the researchers insight into their attitudes to music, music education, music technology and learning with ICT; their history as a teacher and the context in which they work at present.

Throughout the realisation of the subject design initiatives, data was collected in the form of video recordings of lessons and observations of lessons, the pupils’ work and the process of their work as captured by a 30 second screen-save mechanism. Interviews with students, teachers and other classroom assistants have been recorded. This data have been analysed using methods associated with ‘grounded theory’ (Glaser and Strauss, 1967; Strauss and Corbin, 1990). Glaser suggests that we must ‘discover the theory implicit in the data rather than forcing it into preconceived frameworks’ (Glaser 1992). As such, the process has been one of collecting the richest source of data possible and considering the theory as it emerges during collection and data analysis.

BACKGROUND TO WORK IN SCHOOLS

This paper considers the work of two primary school teachers from the same institution and the development of a music design initiative focusing on composition. Jo Heppinstall and Natalie Heysham work in an inner city, multicultural school: Jo is responsible for the reception class and is the school’s music co-ordinator; Natalie Heysham teaches year 6. They both joined the research project openly expressing their lack of confidence, in general, in music teaching. Aside from the very small amount of

training at teacher training college, they have had limited support in developing their music teaching skills further, although recently, Natalie has benefited from working with a specialist teacher with her class every fortnight. Neither had used a computer for their own music making or within music teaching and, before joining the project, they had no knowledge of music software suitable for classroom work. Whilst both play instruments and can read music, they also did not view themselves as ‘musicians’. However, both were keen to involve themselves in the InterActive project, to help develop their skills in music teaching and their understanding of ICT and music.

This was the first opportunity for the Year 6 pupils to use technology fully in their own musical creations. Prior to this project, within school, use of technology for music had been limited to only a few pupils working on keyboards, as part of whole class or group activities. Most often these particular pupils had some keyboard skills, learned in lessons outside school. One boy had had experience of working with similar software packages outside school and another had the software but had never used it.

Year 6’s usual music lessons consist of whole class or small group work which revolve around the use of the voice, percussion instruments and any other instruments played by members of the class. Amongst students in both classes, there is a wide variation in musical experience and aptitude and in student motivation in musical activities.

Having decided to develop work with Year 6, the teachers were concerned with equal opportunities. To enable the other year 6 class to have the same experiences as those on offer to Natalie’s group, the school organised for Jo to teach this class for music for the period of the research, whilst the usual class teacher took over Jo’s commitments.

Changes were made with regards to the booking of the computer room to enable music lessons to take place in this new setting and for the classes to run one after the other. Fitting this around other teachers’ requirements and Year 6 SATs proved difficult and gave virtually no leeway for unforeseen changes.

Jo and Natalie spent a short amount of time with specialists looking at different music software that was on offer suitable for the Primary age range. In the following weeks they trialled the use of different pieces of software with year groups other than Year 6 and, having decided to work with Dance eJay they formulated the details of their music subject design initiative together. Despite their protestations of lack of experience, the researchers were concerned to let the teachers take the lead role in decision-making, rather than formulating ways forward for them, so that, as far as possible, they were comfortable with the work and felt a real sense of ownership. Due to time-tabling there was very little time for researchers and teachers to discuss the work immediately after lessons, so there was little input from specialist music teachers into the design initiative during its realisation. However, we are to repeat it next year, which will allow time for lengthier debate, using the video recordings to review what actually happened, and to

make any modifications. Retrospectively, I realise that this approach worked, for a number of reasons. Firstly both teachers grew in confidence as a result of taking full responsibility in terms of planning and organising equipment rather than working with someone that they viewed as the ‘specialist’ and, secondly, because the teachers turned to each other for support.

THE MUSIC DESIGN INITIATIVE

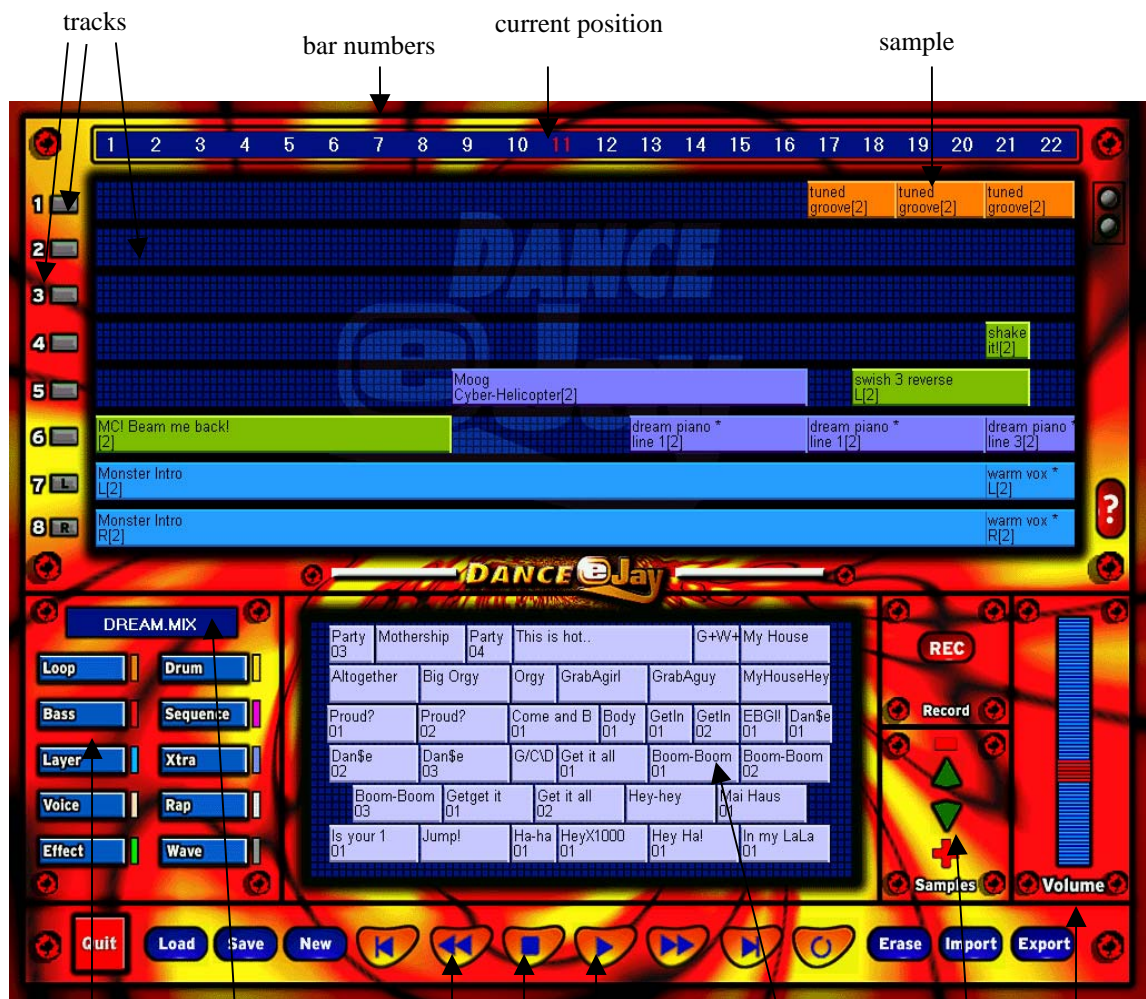
Natalie and Jo devised their music design initiative, to enable students to work together in pairs to compose a piece of music in ternary form using a music software package called Dance eJay (superpack version).¹ The intended aim of this initiative was for pupils to be able to demonstrate the following competencies, all of which relate to the National Curriculum Programmes of Study at Key Stage 2 (shown in the brackets):

- 1) composing skills of choosing, combining and organising musical ideas within a musical structure (2b)
- 2) an understanding of structure through creating a composition within ternary form: Introduction A B A (4b)
- 3) the ability to analyse and compare sounds (3a)
- 4) an awareness of how music is produced in different ways using, ie using a computer (4c)
- 5) the ability to refine and improve their work (3c)
- 6) sensitivity in combining the musical elements of timbre and texture to communicate an intended effect (4c)

Two ‘intended effects’ were required: the 16 bar introduction had to include one continuous sound (*Myth*) throughout it and had to build to a small climax in preparation for section A. Section A had to have an ‘ambient’ or ‘relaxed’ feel. As is required in ternary (sandwich) form, Theme B had to be a contrast to A and theme A had to be repeated after B.

Dance eJay provides the user with a variety of short musical samples which they can organise to create their own piece of music. Each sound is represented as a coloured box with its name on it; these boxes vary in length, according to the length of the sound itself. Sounds of a similar quality have the same colour and are placed together as sound group. Sounds are selected and dragged onto a screen consisting of a number of tracks that can be filled or left empty, depending on the number of sounds that the user wishes to place together. Tracks can be saved in files.

¹ www.eJay.com



tracks

bar numbers

current position

sample

sound groups

file name

rewind play forward

sample window: shows a variety of samples within the sound group highlighted on the left. Others can be viewed by clicking here

master volume

Fig. 1: 'Opening of Dream Mix': Pre-recorded Demonstration Track (provided with the software)

The design initiative consisted of 6 lessons spread over eight weeks, because of a gap of 2 weeks for the Easter holiday. Lessons were generally one hour long. Through absence, Jo missed teaching lesson 3 so, after this point, she was a lesson 'behind' Natalie. She ran a double lesson at the end of the project, to enable work to be completed before the SATs.

The lessons took place in the computer room where the students worked in pairs at the computers.

The focus of each lesson was as follows:

- Lesson 1 Developing an initial understanding of Dance eJay software through teacher demonstration and pupil experimentation
- Lesson 2 Learning new technological skills; learning about the range of sounds on offer in the programme through listening to pre-recorded demonstration mixes; experimenting with different textures to produce a gradual build up in a 16 bar section of music
- Lesson 3 Composition of the introduction section to the Ternary form piece
- Lesson 4 Completion of introduction and composition of the A section to the piece
- Lesson 5 Composition of the B section of the piece
- Lesson 6 Completion of piece by repeating the A section

REALISATION OF THE MUSIC DESIGN INITIATIVE: THE PROCESSES OF TEACHING AND LEARNING

In this part of the paper we provide a brief description of each lesson to

- a) explain ways in which the teachers structured the learning environment for the pupils and
- b) to identifies 'crystallising moments' when it is evident that musical learning has taken place directly as a result of the affordances of the software.²

In **lesson one** the teachers used a data projector to demonstrate how to use the Dance eJay programme. Rather than telling them about functions, they asked students to try to work out something about the package just from looking at the visual picture in front of them. Students were able to identify symbols similar to those on a normal tape recorder/CD player indicating forward wind, rewind and play. This was used as the starting point for a discussion about how to use the software and manipulate the screen. The majority of the lesson was devoted to experimentation in pairs at their own stations. From their own first attempts at using Dance eJay, the teachers were aware of the need

² Natalie and Jo have very similar styles of teaching: as such, when we refer to 'them' this is because both teachers were working in a similar way.

for beginners to familiarise themselves with the general workings of the programme and, as such, included 'experimentation' time, in pairs, as part of the first lesson, and before the pupils began on their ternary form piece. This proved highly useful not only in helping pupils learn about the package but also in allowing them to try out all types of sounds. In their subsequent work, they were asked not to use sounds from the *Rap* and *Voice* sample areas: having had the opportunity to hear these in lesson one, no-one wasted time on them later.

A worksheet outlined tasks, gave advice about how save work and asked for students' written comments on their preferences of musical sounds found in the software. At the end of the session there was time for a class discussion of how pupils coped with the work.

The format of subsequent lessons was largely the same: it began with teacher input and ended with whole class discussion and demonstration of work; most of the lesson time was devoted to pupils' paired work at the computers. Informal opportunities for listening to other's work were built in and the teachers also allowed movement around the classroom to enable pupils to interact with classmates other than those with which they were paired.

Lesson 2 began with a teacher launch, with the teacher seated at the front of the class next to a computer and the class grouped closely around her, on the floor. Both teachers had already dispensed with the data projector as they were having so many problems with it:

(transcript from Natalie's lesson)

Teacher You all need to be sitting on your bottoms looking at the screen. If you've got your books can you not fiddle with them and not look at them...this is what you should be looking at John (pointing at the screen) especially you as you weren't here last time. So, first things first. I'm going to go through, um, the, er, how to save because last week where you saved doesn't allow you to then replay your piece of music. So we've had to work out a different way for you to save so I need to show you that first, um, and, well let's see, who can remember where to find Dance eJay 'Piece One' - the name they were asked to save work under last week. (Lots of hands up. She points at one boy)

Jack My computer

Teacher Jack, my computer (moves the mouse to the icon on the screen. She has problems because no sound is coming out of the computer. Unflustered to the class)

What do you think I should do if I can't make my speakers work? (Pupils offer a variety of suggestions)

During whole class discussions, teachers ensured that all students were focussing their attention on the screen and the teacher, by organising the room to leave space for the children to sit away from the computers and by giving verbal reminders. The continued reference to technical skills, particularly saving work, became a feature of the beginnings and ends of lessons. The teachers' concern to build on previous experience was evident not only in what they said, but also in the way that they constantly asked the students to construct the knowledge. Other general features of lessons include the openness of the teachers about the fact that this was something new for them and the teachers' approach of sharing difficulties with the class. As in this example, confronted with technical problem incidents, both teachers remained calm. In the same lesson, the pupil worksheet included a step-by-step explanation of how to save work so that the majority of students had no problem with this.

After more 'trouble-shooting' the teachers explained the tasks for the lesson set aside about 30 minutes for further experimentation: pupils had to listen to pieces included as demos in the package and consider the way they were structured. The pupils then had to start composing their 16 bar opening. This all took place in pairs at the computer stations. In setting the composing task, the teachers introduced the term 'texture' and explained how developing a gradually thicker texture could help to develop a 'build up'.

In **lesson 3** the teachers used the students' experimental 16 bar pieces as a starting point for the introduction to their ternary form piece. Again the teachers began the lesson positioned at a computer with pupils seated on the floor near them. The class then reviewed previous work together and the teachers played them a model version of what they were to compose themselves that day, emphasising the musical features that were important. In this lesson the teachers introduced additional constraints within the introduction section that pupils were to complete: the need to produce an 'ambient' atmosphere; to include the *Myth* sound as a background to all other sounds and the exclusion of sounds within the *Rap* and *Voice* sample groups (which are quite loud and rhythmic and therefore not suited to an ambient atmosphere).

Jo and Natalie had evidently given careful consideration to breaking up the work into tasks that would be manageable for all students. As a rule, they had decided to focus on one section of the piece each lesson. With the introductory section they also realised that asking students to consider a large number of features all at once, in only the second lesson using new technology, would possibly be too much. Video recordings and interviews with pupils indicate that introducing new ideas over the course of lessons 2 and 3 was helpful in scaffolding learning.

In Jo's classroom, after the explanation of the day's task, Alan and Sonia move to their computer. Alan constantly asked Sonia for clarification of the task; 4 minutes after settling they still had not begun the work but had been involved in a long disagreement about what to do:

(Sonia picks up her worksheet. She reads to herself for only a few seconds)

Sonia You're not supposed to do that!

Alan What you meant to use? (meaning 'what sounds')

Sonia You're supposed to listen to it!...(she reads aloud from the sheet) compose a 16 bar interduction (mis-reads introduction)... you are not allowed use any sound samples from either '*Rap*' or '*Voice*'

This served to dispel the concerns and the pair were able to move on: a clear example of the way in which the pupil worksheet supported the pupils in carrying out their work. The worksheet also served as a focus for listening at the end of the lesson when, as a class, they all listened to each other's work:

Teacher Have a listen. See what you think... note down your feelings on the back of your sheet.

Whilst the teacher engaged individuals in discussion about what they heard, viewing the worksheets enabled her to learn more about the thoughts of all members of the class.

During these 'sharing' experiences, whilst both teachers shied away from using the data projector, they continued to use the computer screen as another point of focus for the students, so that all those who could see the screen could also watch the visual representation as the sound was heard. In this particular lesson, the teacher referred to an error in one composition, by pointing it out visually:

Teacher One thing that wasn't finished ... (she points to the top track of the music and runs her finger along the length of it - from bar 1 to bar 11 - as if waiting for a pupil to articulate; there is no response)

Teacher How many bars were you supposed to use *Myth* for? (The task was to use the sample *Myth* throughout the first 16 bars; Brian had only used it until bar 11)

Class 16

Teacher (affirming) 16. (softly, to the boy who has made the mistake) Read your notes Brian!

At the end of Natalie's third and the beginning of Jo's fourth lessons, the teachers learned that a student in each of their classes had had experience of using eJay outside school. The teachers engaged the boys in conversations, in front of the class, about their work and encouraged them to bring in their own software and examples of their work. It is interesting that the pupils took so long before telling the teacher about this and that they were unable to show their out-of-school work because they did not have the equipment to make copies of what they had saved on their home computers. As a result

of this knowledge Jo and Natalie ensured that these boys with more experience worked on the more complex versions of the software.

In **lesson 4** both teachers composed their own piece in ternary form, with an introduction, as the model for pupils' work. The lessons began with a full explanation of intro, ABA form, with reference to a written description of this on an A3 sheet of paper on the board next to them. After recapping on the features that were required in each section the teacher helped the class to analyse the structure of the piece. First she asked them to put their hand in the air when they heard a new section. Afterwards they listened to the sections again and tried to identify what was happening in each (transcript from Natalie's lesson):

Teacher Can you tell me about the theme A. Can someone describe to me the 'catchy' bit?

Tom It's the orange bit at the top

Teacher Can you tell me...listen (lots of quiet chatter)...shh...tell me what sound you hear that's the tune?

(a girl then sings the melody and the teacher indicates that Tom was right : the part he had seen was the melody)

Here the teacher involved the pupils in multi modal learning: they were asked to listen and their visual, verbal, and musical (singing) responses were accepted. Three minutes earlier, whilst listening to the music seated on the floor, three girls were observed silently developing a movement routine - moving their arms hands and upper body - that fitted the music. This lasted for about a minute; during this time others joined in with nodding heads to the beat; the teachers actively encouraged this kinaesthetic awareness in all lessons as they did in the hand-raising activity just mentioned.

In the above transcript, with reference to the melody, we see how the teacher used language to suit all students in the class. She began by using the term 'the catchy' bit which she had introduced earlier, referring to one of the properties of the melody that was to be included in section A. When she rephrased the question, she uses the term 'tune' which is commonly used by non-specialists. It was only later that she introduced the correct musical word 'melody' although this was the word that featured in the pupil worksheet.

Whilst the teachers encouraged pupils to use specific music vocabulary when discussing their work, visual features of the software package (the representation of sounds as coloured boxes with names) gave pupils with literacy difficulties a vocabulary with which to refer to the music helped them explain what they wanted to their partner and demonstrate understanding to the teacher. During the lesson Kate, a girl stated, in part, because of literacy difficulties was the first pupil in the class to be observed

considering the idea of placing the same sample on a number of tracks simultaneously to achieve an intended effect:

“because that (pointing to the *Waterworld* sample) was so quiet I had to double up on it.”

Unwittingly, the student was engaging with a useful compositional technique - doubling of parts - to achieve a required effect (one of the aims of the lesson) and used the correct name for it. During the lesson the same girl was watched by her classroom support teacher working alone and unaided, completely focussed on the task for over 40 minutes. The teacher commented that Kate usually has extreme difficulty concentrating on work and demands constant attention: the changes in this lesson were ‘remarkable’.

Whilst **lesson 4** followed the usual pattern of launch, paired work and plenary, teachers introduced a new dimension to the project: right at the start, and throughout the lesson, pupils were encouraged to reflect on the different skills needed to compose using Dance eJay and ‘traditional’ instruments. They were asked to write down these thoughts on their worksheet. Whilst we will explore these further, later in the paper it is interesting to note here that, in subsequent lessons, the students included many of these ideas in plenary activities. (Examples occur in the description of **lesson 5**).

Aside from the many formal opportunities for talk in lessons, Natalie and Jo both allowed informal chatting between pairs of students and individuals, which often involved movement from their prescribed stations to other parts of the room. When speaking about the process of composing, the majority of students explained that they were aided not only by their partner but also by their peers. For example, about 40 minutes into **lesson 5**, after a considerable time working in pairs on their own pieces, Natalie suggested that the students might like to listen to other’s work, by accessing their files. Jane and Scott were eager to do this. At their own station, they listened to the work of the pair to their right; the following dialogue took place as whilst the music played:

Jane *Very Rough Cut It* (name of one of the music samples) We can use that on our piece!

Scott (looking towards Jane) That goes really well!

Jane (Leans over towards Jane, looking at her. Speaks louder) That goes really well!

10 seconds further on

Scott (looking at Jane) *Hypa* (name of another musical sample)

Jane (looking at Scott) Definitely!

Scott Yeah!

Jane (looking at the screen and talking to the pair to the right) Stu (their friend's name), We were just thinking about using you things.

About a 70 seconds later, having returned to their own work, Jane tries to explain to Scott which part of their work they should concentrate on, using the mouse she moves the screen to a point near the end of their piece.

Jane Ok *Hypa*

Scott now has the mouse and starts to try *Hypa* at various points on the music.

Jane (to Stu, to their right) We've just nicked a few of your sounds 'cos they're cool!

Jane (to Scott who has been experimenting as to where to insert the sample) That's it!

Jane I don't think that'll go well with *Dream Piano*. (another sample)

Stu *Hypa* does go quite well.

Jane and Scott continue to experiment with fitting *Hypa* into their piece.

Here we can see how Scott and Jane's choice of one sample came about from hearing it used in the context of other's work. The dialogue between the two adjacent pairs also led to a short discussion about the quality of the sound and its suitability how it could be used in relation to other samples of music.

During the whole initiative students were encouraged to help each other with their work. Once paired work began, the teachers took on the role of advisor, supporting those who asked for help in relation to their work or to equipment problems. In many ways, although the teacher was seen as the 'help-line' it was clear to the students that this was a project in which everyone was learning together.

By **lesson 5** the teachers were aware that they might be pressed for time in enabling the pupils to complete their whole pieces. As such, in this and **lesson 6**, Jo and Natalie maximised the time for composing, although they did include listening and discussions activities. By this stage of the project pupils were demonstrating a clear understanding of the form within which they were composing. For many the visual representation of the music on the screen helped crystallise this understanding. Richard remarked to his partner on the work of pupils seated nearby:

"All they're using is purple. All they're using is *Sequence* (the umbrella name for all purple samples). It'll sound really bad."

When questioned about this, Richard indicated that 'bad' meant both boring and wrong. He had identified, correctly, even before hearing the music, that use of the same tone colour in both the A and B sections would result in little contrast.

By this lesson it was also clear that the process of composition was aided by pupils being able to point to sections of music to indicate to their partner, for example, their preference of positioning of a particular sample. When questioned by the teacher or other classmates about their work, pupils often used the visual representation as a starting point for a discussion, for example, about the structure of their piece. The following transcript comes from the very beginning of the lesson in which the teacher had asked for pupils to check that their section A is ‘ambient’ and then move on to composing section B. Pupils had already composed the introduction:

(Scott and Jane look at the screen throughout this dialogue)

Jane We need theme A.

Scott My word!

Jane What? Shall we listen to it first?

Scott Are you sure we’re doing that bit?

Jane See it’s got the bottom bit, remember?

(They listen, and move to the music)

Scott I love that bit!

(They continue listening to the music)

Jane This is where um...our theme A starts.

Scott That’s our introduction, isn’t it?

Jane Yeah and that’s where it starts. (pointing to the screen)

Here, when Jane reminds Scott of the ‘bottom bit’ she is referring to the underlying sample that they were asked to include as the starting point for their introduction: it is the visual representation that serves to help her explain to Scott where they are.

For some students the visual representation of music also stimulated new thoughts about the composition process. During interview, Rory commented on another pair’s work:

“I didn’t think it would sound good ‘cos there weren’t any gaps at all, cos they just had big blocks of grey ...then blue but no gaps...cos if you’re having, like du de la music, then it gets a bit boring”

an observation about the importance of silence in music which he had noted because he could actually see these gaps in the music on the screen. Whilst reflection on and learning about ‘silence’ was not something that the teachers had considered as a focus for this project, it was evident from the student’s own work and from their discussions. In the plenary discussion at the end of **lesson 5** Anna refers again to silence again:

Anna I think at the beginning everyone just put random stuff anywhere; they didn't really think about what they were putting...but now they listen to the music more.

Teacher Absolutely. I think you're right, I think people are listening much more to the sounds. You're not just bunging in loads of sounds for the sake of it – you're actually being much more selective.

Anna At the beginning they just put, they didn't leave any spaces at all, they just put everything up, for the sake of it (inaudible) enough spaces

Teacher So now people are choosing to put in spaces for effect rather than fill the whole thing. Daniel.

Daniel I worked out that I can now sort of keep a constant beat going whereas when you play on a musical instrument, there are real problems for trumpet players...so now I can play it straight off.

This is also an example of the way in which students gradually became involved in discussing how they were learning as well as what they were doing. Daniel, who is a brass player, had difficulties expressing what he wanted to say: he misused the term constant beat. In conversation later, the teacher recognised that he was trying to explain that by saving sounds, you can always retrieve them exactly as they were, whereas when composing with acoustic instruments you have to actually make the sound each time you try out your ideas, which is more difficult.

Even if Daniel's use of the term 'constant beat' was not appropriate in the context of what he was saying, it was important in others. The samples on the programme all have a regular pulse (beat). Observing the pupils' body language and their movement to the music, it was clear that this work was also helping them to develop a sense of pulse, essential to early music experiences: they danced/moved to the music, nodded their head or clicked to the beat, sang the melodies of the samples on their own and with others. A good example of this is from Natalie's **last lesson** when I observed Richard, alone, listening back to his piece which consisted of intro, section A and sections B. He sang along to parts as the music progressed, coping with some quite complicated rhythms then stopped singing and chanted in time, as if conducting others:

“One, two, three, four. Enter (three beats rest) B,e,e,e, NOW!”

so that the 'NOW' happened exactly on beat one of the B section.

FURTHER REFLECTIONS BY PUPILS

At the end of the project, there were opportunities to hear some of the pupils completed work During these final sessions, and in a follow-up questionnaire given to all participants by the teacher, pupils commented on how enjoyable they had found the project. Indeed pupil motivation was clear to all researchers and teaching staff in the

room: there was a very high level of concentration on the work at all times. Listening to what the pupils have to say, it appears that some of these motivational factors relate to the affordances of the software. One non-instrumentalist noted that the software gave access to high quality sounds:

It's a lot easier than learning to play an instrument. It takes years to manage to actually sound good.

Another boy, a competent wind player, also commented on the fact that you did not have to spend time and energy producing the actual sound you wanted because you could draw from sounds that always stayed the same:

You always make the right sound.

Another pupil, who is unable to notate music, discussed the way in which the computer helped the composition process by allowing students to save work. This meant that they did not waste time reproducing work from the past week, nor did they have the problem of forgetting things from week to week.

Comments made by pupils who did not see themselves as 'musical' (largely because they do not have instrumental lessons) were interesting. Some spoke about being motivated by the software because they were given more control over the music they were creating: in normal group composition it was often the 'more musical children' that tried to lead work. Whilst this highlights one feature of the software, it also suggests that organising the pupils to work in pairs, rather than groups allowed for more autonomy. Another girl talked about the embarrassment of trying out ideas when composing with acoustic instruments in groups and pointed out that you can make frequent changes with the computer; no-one necessarily sees the process you go through: ...you don't get so stressed over it and if I do something wrong it doesn't feel bad, because I'm trying it out.

Another pupil remarked that "there's more stuff on computers" by which he meant that there were a wide range of sounds from which to select compared to those normally available in the classroom. This was voiced by many students, as was the fact that the software gave access to a contemporary style of music that the children really enjoyed and often listened to outside school. As Richard and Theo put it:

It has a better beat!

You can make your own music (ie music that appeals to you)

In interviews before work, some pupils - interestingly, all boys - had criticised the fact that they rarely had the chance to produce music they liked.

SOME CONCLUDING REMARKS

With Dance eJay, as with music composing software, the visual representation of the sounds and the frame in which the music is constructed clearly supported learning in this series of lessons.

In his recent research on composing in the classroom, George Odam (2000) discusses how teachers know if pupils are making progress in composing. He suggests that progress can be seen in

- learning technical skills
- learning craft skills
- developing analytical skills
- building a repertoire
- accumulating experiences
- making artistic judgments
- developing social and personal skills.

Work analysing the data is in process and is ongoing, however, it is true to say that within this design initiative, to a greater or lesser degree, all pupils made progress in the majority of these areas. Pupils developed technical skills using technology, in reading a form of notation, in listening and in acquiring appropriate musical language; they learned the craft of sequencing and combining sounds, they learned to use form and to communicate musical ideas and they developed analytical skills through discussing their own and others' work; by composing within a different style of music they were able to build on their repertoire and accumulate experiences. Indeed, many pupils were so excited by the software, they bought it for themselves to use at home. Artistic judgements were made in relation to their own composing and to others' work and students also worked co-operatively to compose, demonstrating an increased degree of independence from the teacher.

The software itself has demonstrated the capacity to redefine the nature of composing and how students go about it. It has enabled the creation of music through aural skills, without the need for theoretical understanding and competence with traditional musical notation thus providing a means of 'democratisation' in the classroom (Goddard, 1999; Airy & Parr, 2001). Furthermore, the visual representation of the music has provided both teachers and pupils with a useful means by which they can talk about music and composing (Mellor, 2001). In the work of this design initiative we have also seen how students who do not engage with acoustic/orchestral instruments have been offered a resource that is very relevant in their lives and which seems to have had an effect on

their motivation. In terms of teaching, the software acted as a useful tool to support non-specialists in their task of providing varied opportunities for music making.

REWORKING THE DESIGN INITIATIVE

Jo and Natalie are still in the process of reviewing the work within this design initiative in preparation for a repeat next year. They are already aware of some changes that could be made to their lessons to improve the learning experience for the pupils. As the project progressed it became apparent that more focus is needed on technical applications, especially the saving of work and that this should be built into the lesson in a structured way.

Furthermore, whilst some pupils used musical vocabulary in discussing their work, the software package defines the sample sounds with its own names, most of which are not in line with usual music vocabulary (see figure 1). Teachers are considering ways in which students can be supported in developing a broader music vocabulary, this might include a class discussion about the qualities of the samples in relation to the names given to them by the manufacturer.

All staff involved are aware that the use of ready-made sounds, as provided by this package, has its limitations on composing activities, since there is no opportunity within the programme itself to actually produce one's own sounds and manipulate these. When asked how the software might be used in the future, pupils themselves suggested that music created on the computer might then be used as a background to vocal or acoustic instrument work. This sort of addition to the present design initiative would give breadth to the work by including the experience of creating as well as manipulating sounds. It could also offer more opportunities for differentiation if those with instrumental competences were encouraged to use their orchestral instruments when adding these other parts.

Given that this alternative plan of work would also involve staff in more technological work during or after class time (eg downloading music from the computer onto CD) how confident would they feel? Certainly, both are aware that the use of technical equipment other than computers in the classroom needs to be considered. After problems with the data projector in lesson one, both teachers opted against using it in future lessons, despite the fact that it provided a much better visual focus for the class than was possible on a normal computer screen. This was understandable given the amount of time and thought that had to go into the organisation of computer equipment, the pupils and other materials.

A national concern in relation to music technology is the need to consider the most appropriate forms of assessment of work and this will have to be considered in the light of students working together rather than individually.

As researchers we are keen to look carefully at the data and to decide whether changes can be made to how we collect evidence, particularly in improving the capture of sound of the music from the computer and the pupils talk at the same time.

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