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To investigate practical approaches to teaching and learning with music technology in primary school classrooms with an emphasis on digital projects that enable to students to compose and create.

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Signed:

Dated: 30th September 2007

Dedicated to the memory of Merryn Chapman

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PART I – INTRODUCTION

Project Aims

To investigate practical approaches to teaching and learning with music technology in primary school classrooms with an emphasis on digital projects that enable to students to compose and create.

My general guiding aim was to broaden and deepen my view of creative interaction with technology in an educational context.

More specifically, I aimed to:

- understand how digital projects, which explicity encourage students to create, have a role in equipping young people for a complex future
- observe projects that capture and develop young peoples' voices in new and exciting ways
- visit a range of organisations that help foster creativity through partnerships with schools
- observe and learn from these organisations methods of communicating and promoting investment in digital projects
- understand the structure of these organisations in order to assess potential for growth in Victoria, Australia
- investigate the potential of collaborative digital projects
- meet with the music and ICT advisor to Qualifications and Curriculum Authority (QCA) and National Association of Music Educators (NAME) to illuminate the British context
- meet and shadow leading teachers, software designers, sound artists and composers who work in schools in order to deepen my understanding of creativity and technology in an educational setting
- meet and exchange ideas with academics and project managers
- deepen and clarify my understanding of planning and assessing children's creative development
- develop an understanding of the role creative music/sound ICT projects can take in community regeneration
- learn more about the artistic, cultural, social, technological and econic benefits of my project
- develop an understanding of community cultural development and its relevance to Broadmeadows, Australia

Introduction and Project Context

The foundations of the current Australian education system were set up in the nineteenth century to meet the challenges of an increasingly industrialised economy. In the UK, the modern education act was introduced in 1944. As the rate of technological change, scientific discovery and information increases, and as the movement of people and cultures between borders continues, the economic and socio-cutural situation for the USA, the UK and Australia at the turn of the twenty first century is completely different. The structure and content of education systems in many countries are being rethought in light of the changing situation.

An economic rationale for developing the creative skills of young people can be seen in the burgeoning intellectual property sector, which focuses on generating new ideas rather than manufacturing products. In the USA this sector is valued at $360 billion a year, more than the automotive, aerospace and agriculture industries respectively[1]. Growth in the creative industies, part of the intellectual property sector, results in a healthy interaction between science, technology, the arts and entertainment industries. Education has a lot to gain from this interaction.

There are certainly many external factors that validate the inclusion of creative projects that use technology in schools, workshops and the community. From this process many social, cultural and potential economic aspects can be drawn that benefit the good of society and contribute to a positive future, and it is important that this research continues to be publicised and promoted at policy level as well as in schools and communities. However, I'd also like to acknowledge the intrinsic value of participating in the creative process. It is a process valuable in its own right, independent of whether it benefits the economy or a future workplace. Creating original work is rewarding, even thrilling. Watching a project grow from an initial intangible starting point to a finished product, to be listened to, watched and experienced gives immediate feedback that is meaningful to young people's lives. Creating original work enhances individuality and inquisitive thinking. These features of the creative experience present a valuable reason for integrating creative projects into schools and communitites.

For the purpose of clarity, I have included a definition of creativity: imaginative activity with purpose where the outcome is original and of value[2]. The creative process includes both generative and evaluative thinking – a stage where material and new ideas are generated is followed by a structuring and ordering of these ideas. Finally, the outcome is refined. Features associated with creativity and creative learning have been included as appendices.

Further, the term ICT (information and communictions technology) and technology are used interchangeably throughout this report. This encompasses software applications, digital recording technology, new interfaces for musical and artistic expression, mobile communications, the internet.

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1   "The Challenge for Education" NACCCE Report, paragraph 4, 1999.
2   "Creativity" NACCCE Report, 1999.

EXECUTIVE SUMMARY

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To investigate practical approaches to teaching and learning with music technology in primary school classrooms with an emphasis on digital projects that enable to students to compose and create.

Highlights

USA   University of Washington, Seattle
            Manhattan New Music Project, New York
            Music Cre8tor, New York
            Orchestra of St Luke, New York
            New York University

UK   School of Education, Cambridge University
            Spaldwick Community Primary School, Cambridgeshire
            Creative Partnerships: Manchester
            Greater Manchester Music Action Zone and Gorse Hill Studios
            Liverpool Institute of Performing Arts (LIPA)
            Shaugh Prior Primary School, Dartmoor
            Arduthie School, Stonehaven, Scotland
            Sonic Postcards, London and Aberdeen

Conclusions

- Using technological tools is a necessity for the young person of the 21st century. The digital and creative projects outlined in this report are also a link to the world outside the classroom. Music technologies provide a vehicle where creative learning meets digital applications. Young people become active learners motivated by their own expectations when their education encompasses technology and creativity.

- Creative skills will be among the most sought after in future workplaces across all industries (including business and the private sector). Raising literacy and numeracy standards are important but education needs to encompass far more if it is to help prepare young people for a complex future. In addition to academic qualifications, employers are looking for qualities such as creative skills, ability to communicate, empathy and social skills[3].

- Education and pedagogy must continue to evolve in order to meet the needs of our future citizens. Sustained partnerships between schools and creative practitioners, teachers and academics, technology professionals and educators will assist in this moving forward.

- Original sound and music produced by and for young people should figure prominently at

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3   "The Challenge for Education" NACCCE Report, paragraph 5, 1999.

school, online and in the wider community.

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- Julia Reinhart, Director of the Manhattan New Music Project, New York
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- Tony Whitehead, Sound Artist, Conservationist, Totnes, Devon
- Becca Lawrence – Development Director, Sonic Postcards
- Pippa Murphy, Composer/Sound Artist, Sonic Postcards, Scotland

PROGRAM

USA

Donald E. Petersen Professor of Music: Patricia Sheehan Campbell, University of Washington, Seattle

The University of Washington in Seattle has a vibrant and dynamic music education faculty. It is also known for its in-depth ethnomusicology department. I spent time with Professor Patricia Sheehan Campbell, participating in post-graduate seminars on children's musical development and observing, with Professor Campbell and a PhD student, student teachers in the field. During my week with Professor Campbell I was able to discuss the value of creativity and technology in music education. It was also a valuable introduction to the American education context.

Although I didn't see any specific music technology projects here, I was able to learn about the University of Washington's innovative teacher training program. All education students study the music of an ethnic group in the area, and learn to perform some of that group's traditional music. They then spend time with the community, listening to their music making and performing music for them. This takes place over a semester or a whole year and it is an attempt to provide meaningful opportunities for future teachers (mostly white middle class) to engage with a Mexican community or a Native American Indian population on a reservation.

Professor Campbell is also a dedicated advocate for music education and she has delivered speeches (backed by qualitative and quantitative research) in music's favour to Congress and various senators on both political sides. Music has dropped out of the language of politicians and out of the memory of many parents[4]. There is no guarantee a school will have a music program at all and America has gone through a time where a wholistic approach to educational programming has been eroded in favour of producing academic results that describe a schools' "success" or "failure". If schools don't perform, their Federal funding is witheld. This has had a domino effect on schools with large migrant or underemployed populations and has produced a culture of "teaching to the test" as entire curricula become focused on producing results in the areas of numeracy and literacy. Known as Bush's "No Child Left Behind" policy it's had a huge impact on the arts.

As I observed accomplished instrumental music programs in action in several Seattle high schools I was reminded of the tension between an established status quo (responding to external pressures, expectations and forces like standardised testing) and creative, student-centred, student-voiced, inclusive approaches. Some questions I thought of at this time were: can skills-based teaching (like instrumental/notation) and creative approaches that frame the student voice (composition, sound art, digital collaborations) co-exist? How can we integrate creative music-making into a crowded curriculum? How can we strike a balance between developing skills and allowing children to create and contribute something original?

During my time in Seattle I deepened my understanding of the American music education context and continued evolving my ideas about children's musical development. In addition, it was insightful to learn about the University of Washington's approach to meaningful multicultural education for future teachers. These new teachers can become agents of change, in both disadvantaged and advantaged, predominantly white settings where many new teachers gravitate,

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4   Conversation with Professor Patricia Campbell, Thursday April 27th, 2007.

opening out traditional, culturally-insular pedagogies and curricula to include a real engagement with multiple cultures. This approach encouraged me to think about the place of ethnomusicology in a creative, technology-rich curriculum and had some surprising connections to other projects and research I was to visit in the UK.

Manhattan New Music Project, New York

New York's Manhattan New Music Project (MNMP) began life as a performing arts organisation founded by a group of composers in 1990 with the aim of fostering the creation and presentation of new musical works[5]. Education was always part of their vision, and the MNMP has been involved in delivering programs to New York's public schools since 1993. By 2000, the MNMP formalised this mission by entering into significant contracts for arts education with the NYC Department of Education. A particular focus was creating programs for children with special education needs[6].

I wanted to visit the MNMP for several reasons:

> a) The ethos of the child as creator. This is central to all projects and programs. The MNMP sees itself as playing a vital role in fostering and developing New York City's future innovative artists and thinkers;
> b) The success of their long-term artist residencies, a three-way collaboration between the artist, the students and the teachers. Students and teachers have access to a high level of artistic knowledge and creativity. Residencies have impact on a school beyond the time frame of the project itself;
> c) Their engagement with technology at a number of levels. From use of music technology as part of student-created music theatre programs to investing in the development of a new interactive sensor-driven musical device especially aimed at students with disabilities;
> d) Many projects take place in schools in "underserved[7]" communities or with challenging student populations and play a significant part in engaging these students;
> e) The MNMP connects their creative programs with the New York Department of Education Arts standards to ensure relevance to the curriculum in music and other subject areas;
> f) Essential skills developed during the process of an MNMP program include learning about the learning process and creative problem solving;

Julia Reinhart, Executive Director, MNMP

I met Julia Reinhart, Executive Director of the Manhattan New Music Project on Thursday 3rd May, 2007. I was interested in what had contributed to the success of the MNMP as a lively artistic and educational organisation. Julia emphasised the foundation of the organisation was built by passionate composers who were committed to the creation and performance of new work. This ethos became embedded in the education partnerships the MNMP initiated and evolved, where musical composition and artistic creativity, improvisation, and performance is embarked upon as an everyday aspect of classroom learning that empowers children to become artistic creators[8].

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5   www.mnmp.org accessed 2nd May 2007

6   All schools in New York are grouped by geographical district and administered to at a municipal government level. All special needs schools are grouped, regardless of the geographical location, into District 75.

7   "Underserved" is a term that relates to the economic, social and cultural conditions of a community. It is used in New York City in place of "disadvantaged".

8   www.mnmp.org/history.html

A range of funding sources[9] kept the MNMP afloat until significant grants and contracts with the US Department of Education and Board of Education saw them emerge as an established arts and education organisation.

The New York Department of Education has four arts standards. The first two – *Creating, Performing, and Participating in The Arts* and *Knowing and Using Arts Materials and Resources* are used by the MNMP as a backbone for their programs. Standard one describes what students will do:

> Compose original music and perform music written by others. They will understand and use the basic elements of music in their performances and compositions. Students will engage in individual and group musical and music-related tasks, and will describe the various roles and means of creating, performing, recording, and producing music[10].

Although composition figures prominently here, many schools can address this standard through traditional band programs and choir performance, since the performance of music written by others is packaged with compositon. While learning an instrument and playing in a marching band or wind symphony is a valuable skill in its own right, it does not exactly place a student in the same challenging situation of creative music making that I am concerned with here. I asked Julia about the percentage of schools that engage students in creative activity and she mentioned that many teachers find it difficult to let students write their own music. There is a degree of creative control that a teacher must sacrifice and if a music teacher has never composed music themselves, there may be trepidation or indifference towards this activity. The MNMP teacher artists work in partnership with the teacher and school to provide exciting and challenging arts activities where the students produce something original, where their own voice counts. This is often a revelation for students and teachers as the creative process becomes demystified. For many teachers participating in an MNMP project can bring about a change in attitude toward incorporating creative work in the curriculum.

The second standard, *Knowing and Using Arts Materials and Resources,* is also of interest as it encourages students to, "use traditional instruments, electronic instruments, and a variety of nontraditional sound sources to create and perform music"[11]. Julia highlighted the disparity in schools' resources in the New York area. Public schools in wealthier parts of Manhattan are very well-resourced, as parents fundraise, use business connections and even donate computers and electronic equipment to the school. Many other public schools, especially those in underserved communities lack modern resources, some even have no computer access[12].

Jane Rigler, Teacher Artist, Technology Program Coordinator, MNMP

Jane Rigler is a flutist, composer, improviser and educator who is active as a performer/composer in America and Europe. Her compositions and improvisations often incorporate interactive technology and she has an interest in designing and developing both software and new hardware. I initially made contact with Jane because her background was so similar to mine (a performing artist who began creating music and sound using technology) and she also works in education. As Jane had travelled a similar road to I and was a little further on, I thought it would be interesting to

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9 Such as: New York State Council for the Arts, BMI Foundation, Virgil Thomson Foundation, the National Endowment for the Arts and the American Society of Composers, Authors and Publishers
10 From New York State Education Department Arts standards, http://www.emsc.nysed.gov/ciai/arts/artstand/arts1.html accessed 3rd May 2007.
11 From http://www.emsc.nysed.gov/ciai/arts/artstand/arts2.html accessed 3rd May 2007.
12 Interview with Julia Reinhart, Tuesday 3rd May 2007.

see the way all three areas – education, composition, technology – interesected in her work and how this benefitted students, teachers and other arts workers.

I spent time with Jane while she was working in two schools on Creative and Innovative Arts Education (CIAE) projects through the MNMP as well as another composition project through New York organisation, the Orchestra of St Luke in a third school. I was also present at a development meeting with Jane and a programmer Zachary Seldess regarding the sensor-driven Music Cre8tor. These four projects will be described below.

The Creative and Innovative Arts Education Project (CIAE)

The CIAE project is a large-scale visiting artist initiative from the MNMP. The MNMP invites schools to apply to participate in an art/music making event with two visiting teacher artists, one with a background in music, one with a background in theatre. The emphasis is on the collaboration between students, teachers and teacher artists during the entirety of the project, which takes place from September (the beginning of the school year in the US) to April. Weekly space in the school timetable is dedicated to meetings, workshops and rehearsals. The teacher artists have an enabling role for both the teachers and students as they assist all through the generation and production of an entirely original music theatre event. The outcome of this six-month collaboration comes in the form of performances, displays and exhibitions. I came into the process right at the end and I was able to witness the last rehearsal and final performances in two schools.

PS721K Roy Campanella Occupational Training Center, Avenue X, Brooklyn, New York

PS721K is a special school for intellectually disabled students in their teens located in an outer suburb near Coney Island, Brooklyn. There is a focus on vocational education and life skills as the students prepare for life post school.

The last rehearsal took place in the music room with the students, Jane and the music teacher, Mr Criscitiello. Final technical requirements were worked out and practised for PS721K's event, *Coney Island Friday*. In this project, the students were not really involved in producing digital content for the music theatre performance, although some had a hand in operating lights. Jane was responsible for collating the musical cuts to be played on cue during the performance.

The accompanying music had been played by the students on electric guitars. Three students played a different chord each on their guitars so that each chord change was played by a new person. In this way, the students were able to record the chordal accompaniment to their song even though playing it through all the way at tempo may have exceeded their abilities.

There was an air of excitement in the room as the students sang their own songs and recited their own lines. During this rehearsal I saw pride and confidence in the students. When I came back for the performance on May 11th 2007, I was amazed at the quality of the sets, lighting and selected colours as well as the complexity of the story – all student created. They performed to a full house of parents, friends and members of the local government.

Young people with an intellectual disability face many challenges as they enter the world of adulthood. So it is worth noting the sense of achievement felt by the participants as they sang their own music in their own words to a large appreciative audience. During the process they had learnt about arranging the elements of music and creating melody, constructing a plot, working with a range of emotions and selecting appropriate sound and music to highlight particular points in the plot, as well as solving design and logistical problems in the form of set and stage management.

PS752Q, Queens School for Career Development, Jamaica Heights, Queens, New York

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PS752Q is a school for students with challenging behaviours who have been excluded from mainstream education located in the outer reaches of the borough, Queens. Most of the students had not experienced school with its emphasis on academic results and traditional structures in a positive light before entering Queens School for Career Development. Music and music technology feature strongly in the school as one the few subjects capable of motivating and engaging students for significant periods of time. Students can spend hours on end, totally absorbed in creating a new hip hop[13] track in the music room or recording each others' raps[14] and lyrics. One student I met had experienced such a degree of success through working with music technology and recording equipment that she was considering a future as a producer.

Music teacher, Ed McKenna, built the music technology resouces from scratch over five years. He applies for and often receives funding from private souces and endowments. This is not uncommon in the US – most teachers I spoke to told me they were responsible for raising funds to develop a music program and it is certainly not a given that a music teacher will receive any slice of the school's budget pie for this goal. Ed had set up a recording booth with a high quality vocal microphone. He was running "Reason" on eight Mac computers and there was another computer running "ProTools" dedicated to recording vocals and instruments. Students produced their beats using "Reason", which is a sequencer, a drum machine, a sampler and a synthesis tool.

Hip hop, as a language and cultural expression, is important to the identity of many young African Americans. Many of the students from the Queens School for Career Development would be aware of the history, the legends and roots of hip hop in New York's South Bronx where rival gangs came together to compete with sound systems, breakdancing and MCs. At a time when the South Bronx communities (African American and Puerto Rican immigrants) felt particularly marginalised and ignored by the authorities, hip hop emerged as a vital cultural voice that expressed the harsh realities of life and actually played a part in bringing about truces between rival gangs and generating a sense of pride in people who had been struggling. As a genre of music it has moved a long way from the original context and is now responsible for a large part of the recording industry's income. Despite hip hop's mainstream status the energy and combination of beats with rhyming lyrics still has meaning for young people in New York and around the world[15].

When there is an opportunity to create, the voices of these socially excluded youth find expression through hip hop. Much of the material generated by students in the music program is in the hip hop idiom and the CIAE project would not have gained currency if it had been built around traditional music theatre songs.

Jane and a teacher artist, Victoria Oltarsh had been working with the school for six months. Two classes produced two different shows. I was present at the rehearsal and performance of "Victory is Justice in the Neighbourhood" by Class VO3. The students wrote the story around the theme of justice and conflict. The show included an altercation between rivals and a resolution as all were involved in building a community centre. As well as the creative learning and problem solving experienced throughout the six months, the themes the students volunteered, placed in the plot and resolved were solid life lessons. Verse three of the rap sums it up:

> An accident happened trying to get that cake
> Now I got another chance to correct my mistakes
> The center got built as a way to pay homage
> Now I'm goin' off to college to get more knowledge[16]

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13 See explanation in the paragraph below.
14 The spoken rhyme delivered in a rhythmic fashion over sampled and electronic drum beats and other sounds.
15 In Australia, there is a growing number of Indigenous hip hop artists.
16 Playbill "Victory is Justice in the Hood", Queens School for Career Development, May 11th 2007.

Seeing the students perform was extraordinary. Jane had told me how their behaviour at the beginning of the project was indifferent and antisocial and remained so until they began to trust her and Victoria. The process had been a challenge. It was clear a transformation had taken place as the students stood on the stage, most for the first time in their lives, and told and rapped their stories. In the foyer of the hall, an exhibition depicting the process in photos, video and work samples was popular with friends, family and staff.

Orchestra of St Luke's Young Composers Program

MS 131 Dr Sun Yatsen School, Chinatown, New York

Another creative arts partnership I observed was the Young Composers Program through the Orchestra of St Luke, a professional ensemble. Composers are assigned to small groups of students from schools in different parts of Manhattan. The composers provide workshops and assistance through an eight-week period. The finished compositions are played by members of the Orchestra of St Luke in a large public performance.

As appointed composer, Jane had been working with six twelve year old special education students at the Dr Sun Yatsen school in downtown Manhattan. The school has a mixed-ability population with there is a large percentage of integrated students with learning difficulties and/or slight to moderate physical disability. The special education teacher worked very closely with Jane and the students throughout the workshops.

Jane had helped facilitate the development of the students' compositions by helping them find ways to generate musical ideas. As the students had no prior musical notation knowledge, a large part of the workshops had been exploring different methods of notating and communicating their musical ideas to the Orchestra of St Luke musicians playing flute, french horn, violin and cello. The many alternatives to traditional notation found in the 20th century composition literature were shown as examples. For example, text-based and graphic scores or traditional staves cut up into smaller cells and positioned spatially on the page. The role of improvisation had also been discussed. A focus on the musical elements and their corresponding representation on the page was explored on the day I visited: the range of the instruments (high pitch and low pitch), dynamics (how to signify a loud sound or a decrescendo), melodic shape, harmony using notation and repetition and form.

Jane mentioned a goal of the workshop had been to flesh out the young people's pieces and extend them. They had innumerable ideas in place already but they needed to coalesce them into a whole. In previous workshops, Jane had covered mood, atmosphere and stories, and the boys had their ideas about what they wanted their music to do. They had generated a seed idea that "sprouted" longer and larger sections. Some of the students were very clear about their composition and were determined to have the Orchestra of St Luke musicians play their music in a very specific way. Others were slightly concerned about which ideas to select and order. The special education teacher was of assistance in this area as he had an understanding of the students' cognitive limitations.

Nonetheless, I was impressed with what the students had achieved already. I could see the advantage of working with a smaller group and they had progressed markedly in the short time they had been thinking and working through this complex process. The students were also looking forward to hearing their compositions played. I know from experience, there is nothing quite like hearing your original work performed by professional musicians. Jane played some of the work on her flute – aural feedback is important.

The high-profile public performance at the end of the residency places pressure on all participants to achieve an outcome of a high standard. While it is important to aim high it's also necessary not to rush a students' development prematurely. These boys, who struggle in the classroom with English and maths, were achieving something incredible. They had no formal music training and yet they had composed music. They worked out notes and motives, rhythm, structure and timbre and thought deeply about mood and atmosphere and translated this into their musical vision. Professional organisations must be prepared for young people's voices – they are going to sound different!

Music Cre8tor

The Music Cre8tor is a new interactive sensor instrument designed with the needs of physically and intellectually disabled students (and others) in mind. I was present at a meeting between Jane and programmer and co-designer Zachary Seldess. The main points of discussion at that meeting were designing a relevant, user-friendly graphical user interface (GUI), attaching graphic panels (the front-end) to the engine of the synth and audio file playback.

Music Cre8tor: Background

Julia Reinhart and the late Paul Nash (one of the founding composers of the MNMP) initiated the project several years earlier. Jane Rigler came on board as Technology Program Co-ordinator at the MNMP and began designing the instrument with Zachary Seldess.

The Music Cre8tor is an interactive music composition system controlled by motion (accelerometer) sensors that are held or can be attached to a person's wrist, arm or leg[17]. The interface was programmed in Max/MSP software and now exists as a stand-alone file that can run on any computer. A stand-alone application is one that can run without a need for particular software. The device is still in development. It has been tested with disabled student populations in Ancorage, Alaska as well as New York and Jane and Zachary maintain a dialogue with teachers, therapists and parents.

Music Cre8tor: Set-up and Use

The Music Cre8tor can be "played" by up to four people. Each person, with the help of a guide, teacher, parent or assistant, can select a different instrument (one of 127 MIDI instruments or a computer-generated oscillator) to play by moving the sensor, located inside a small plastic box. Sound files can also be triggered by the movement. The sensitivity of each sensor can be adjusted to suit an individual's physical requirements so that even very small movements can be tracked or large, unpredictable movements can be de-sensitised while still registering control. When the Music Cre8tor becomes commercially available, the cost to schools and community centres will be affordable. The device can run on any computer (Mac and PC) with the minimum requirements of: 700 Mhz processor or faster, 128 MB of RAM, 60 MB of free hard disk space, 1024 x 854 screen resolution, a USB 2.0 port. A custom-made sensor-interface box, a MIDI-interface and a tutorial guide will be packaged with the sensors[18].

When I saw the Music Cre8tor, the sensors were attached to the sensor-interface box with leads, but Zachary mentioned they were aiming to have it wireless in the future. The sensors can also trigger and control pitch direction, stop-start pre-recorded rhythms, timbre and dynamics. All tempi

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17 Rigler, J and Seldess, Z 2007, "The Music Cre8tor: an interactive system for musical exploration and education" in Procedings of the 2007 Conference on New Interfaces for Music Expression (NIME)", New York, NY, USA p.415
18 *Ibid.*

can be synced to a designated tempo like a sequencer.

Music Cre8tor: Music and Composition

The Music Cre8tor encourages a kinaesthetic connection and interaction with the sounds produced and created analagous to a musician playing their instrument and hearing the results. The difference is far more immediate with the Music Cre8tor as years of training and practise are not required in order to hear a satisfying musical outcome. Players can experience the cause and effect of their movements that directly correspond to rhythm, melody and other basic elements of musical composition[19]. Jane mentioned children she had tested it with had experienced much joy as they shook and wobbled the sensors rhythmically and were easily able to generate and control sound. The effect of their gestures could be heard instantly.

The potential for this device to be used as a composition tool is significant. As part of the set up a number of decisions are required about instrument, timbre, rhythm, sound source (use of a pre-recorded sound file or computer-generated sound) and tempo. These kind of choices are in line with those composers make when planning a composition. Even very disabled children can be included in these choices if the teacher or guide frames the question simply. More able children or adults could make these decisions themselves. While the device can be used in a real-time improvisatory context, it is also possible for plans to be made about the form and structure of the composition and for the output of the performance to be recorded.

Music Cre8tor: Conclusions

The Music Cre8tor is an important addition to a growing number of new interfaces that enable musical expression[20]. It is an exciting and engaging digital tool that is simple to use. It could be used in contexts such as the special school classroom, music therapy, rehabilitation centres, adult care centres, nursing homes, hospitals, community music workshops, the home and mainstream education with a targeted group of students. There would be management issues to consider in a class of twenty nine primary students, although with careful planning, this could be overcome.

The Music Cre8tor combines a range of different timbres, including pre-recorded sound files. This elevates sound as a material for composition to a position alongside traditional musical instrument timbres and discrete pitches, long a philosophy of sound artists and electroacoustic and acousmatic composers. Including sound files in the timbre bank of the Music Cre8tor encourages players to interact with real-world sound. There are particular therapeutic uses here. Jane and Zachary write that the Music Cre8tor exceeded their original expectations:

> What was first conceived as a fun, educational tool has, through development, transformed into a valuable instrument for experiencing the relationship between kinesiology, sonic creation and perception of the world around us[21].

The trialling of the Music Cre8tor with its target population together with teachers, therapists and administrators during development is central to its success and relevance. Jane and Zachary's openess to accomodate suggestions and keep key personnel in the feedback loop during the design process made the Music Cre8tor suitable for educational and/or therapeutic contexts.

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19 *Ibid.*

20 Other examples include the Soundbeam http://soundbeam.co.uk and the Midicreator http://www.midicreator.co.uk both from the UK.

21 Rigler, J & Seldess, Z p. 416 (2007)

Dr John Gilbert

Director of Music Education, Department of Music and Performing Arts Professions, New York University, New York

I met Dr John Gilbert on Tuesday 15th May, 2007. He founded programs at New York University such as music technology (the first in the country), music therapy, film scoring and music education. Music technology is central to all the music programs at NYU, including teacher training, and this prompted me to seek a meeting with Dr Gilbert. He was positive about this generation of graduate teachers: most are enthusiastic about bringing music technology projects to the music curriculum.

In most schools, it is likely that computers are set up in a lab situation where students work individually or in pairs on gaining proficiency in certain software. While there is certainly a place for this kind of practice, I was interested in gaining some insights about using technology collaboratively, in ways that encourage student-to-student interaction that would also be conducive to creative activity. The Music Cre8tor and other new interfaces serve this purpose, and I was also looking for strategies to incorporate computer hardware and software and related electronic devices. I was looking to address the issue of classroom management: one or two computers in class of twenty nine students is unworkable as most students are not able to engage with the technology in a educationally meaningful way.

Dr Gilbert mentioned he was interested in the educational potential of collaborative technology settings rather than the computer lab scenario. He had been trialling a project that fostered collaborative learning via technology. Cheap, second-hand laptops enabled for wireless internet access had been secured by some schools. Each group of five students has one of these laptops and they are set up on the floor with the students clustered around them. The teacher has a digital projector and projects her work as a model to instruct or for troubleshooting. This model is flexible: it allows for movement between teacher-directed instruction and student-centred modes of learning. It also accomodates the different abilities and work speeds of the group. More able students could assume the role of instructor as peer-to-peer teaching is a valuable asset. Students can work on composition projects together using a range of online or offline software, they can be loading sound they recorded previously, they can set goals for what they want to achieve next week and publish it in the class' blog[22]. This model places responsibility for learning on the students, while also providing adequate scaffolding as students develop skills need to use and manipulate software. Of course the need to share and take turns would have to be emphasised by the teacher.

A further outcome of this model could be setting up a creative exchange with another school in the local community, interstate or internationally via a video hookup using internet communications technology. Freely available internet communication tools like Skype for PCs or iChat for Macs include video. Schools could embark on a number of joint projects in this way. Some examples could include:

- sharing partially completed electronic music tracks and remix each others music
- plan a radio show and interview each other
- recording the output and including it in a final mix
- write a soundtrack to the other school's animation, short film or creative stories
- compose one section of music each and put it together in a live performance one after another[23]

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22 An online diary that can be edited and updated. Images, video and sound can be uploaded.
23 These were my initial ideas after hearing about the video hookup.

- simultaneously play percussion instruments together.

This last idea is perhaps the most difficult to work in practice due to the challenge of monitoring what was going on in the video of the other class as the students in the room excitedly play in their ensemble. Latency (a slight delay between what is played and what is heard) could also be problematic. Dr Gilbert had trialled this last project with a group of graduate students during a multi-arts summer school and he reported it's success as far as creative exchange with a group of French students went although there were some latency issues. The other projects mentioned have an array of benefits for the primary music classroom and also encourage cross-curricular links in the area of the environment, science, social studies and English.

Dr Gilbert believes mobile phone technology will be increasingly utilised as phones with internet access become more affordable and widespread and many students already own one. These phones can be used as tools for creation in a number of ways: it is possible to create ring tones and jingles on the phone; using the step-based ring tone creator could be used in a lesson about melody and rhythm; students can download a piece of electronic music they created using a piece of software to save on their phone or select it as their ring tone.

Dr Gilbert emphasised that learning with technology should enable students to become independent, critical users. For this reason it was important not to become too reliant on a particular platform, operating system or piece of software and to constantly reflect and ask questions – as teachers, students and parents. He believed in making technology accessible and encouraging students to become good problem solvers, relying on their learning experiences with technology to assist them in future scenarios.

Young Audiences, New York

Other schools visited in New York included the PS194 Raoul Wallenberg in Sheepshead Bay, Brooklyn and the Yeshiva School, Yeshiva Rabbi Sanson Hirsch, north Manhattan. I observed two teacher artists delivering creative music making activities to younger students. The residencies are part of Young Audiences, New York, an organisation that supplements music programs in schools across the boroughs.

Hans Tammen, Harvestworks, New York

Harvestworks is a fantastic resource for artists in New York. A nonprofit organisation, it provides workshops, seminars and initiates research into creative digital technology and the arts. Harvestworks also provides opportunities for artists to exhibit experimental work created with digital technologies[24]. During the summer they have workshop options for students aged ten to sixteen. Current examples include Digital Audio (record and edit a track with a professional sound engineer) and Make a Film (from story boarding to shooting to post production). Past workshops included, Game Camp for Kids, where participants design the architecture and sound for a computer game.

I met Hans Tammen, director, on 16th May, 2007 to talk about the extent to which Harvestworks is utilised as a resource for young people. Although its primary focus is on providing further education opportunities for artists, Hans mentioned the importance of providing some workshops for the younger generation. He told me most school's were either not well-equipped to provide regular, creative encounters with technology or the curriculum was already filled with other activities such

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24 Harvestworks email list , news@harvestworks.org, Wednesday 29th August 2007.

as band and instrumental programs. Harvestworks' intensive workshops for young people are available during the summer and are located at their downtown studios. Harvestworks' aim is to make technology accessible to artists, a reminder that education does not stop at school or university.

UNITED KINGDOM

Cambridge University: Dr Pamela Burnard

On Monday 21st May, I visited Dr Pamela Burnard at the School of Education, Cambridge University, Cambridge. One of Dr Burnard's research interests is music composition in education and the creative development of children. I had read several journal articles and research reports co-authored by Dr Burnard[25] and I was keen to meet her to talk about the place of creativity in education. I then observed a supervision session with Dr Burnard and a Masters student. I was also fortunate enough to carry out some research in the Cambridge School of Education Library.

Dr Burnard talked about the importance of making space in school life and culture for children's original work. As children's art work is placed on display and accepted as an expression of an individual's imagination and inner thoughts, so should their music be accepted as an expression through sound and movement. Young people's compositions and original sound work should be played and performed in prominent situations at school and in the community. No one expects an eight-year old's painting to look exactly like Rembrandt and neither should we expect the eight-year old's musical composition to sound exactly like Mozart. The music that children create can be richly expressive, surprising, upbeat, energetic or quietly reflective. Many schools may require a shift in staff and school leaders' attitudes so that they begin to appreciate the value of young people's original music and learn to include and embrace it in the school's culture. The hectic life of non-specialist classroom teachers with their many pressures and curricular demands may preclude them from initially taking an interest in their student's compositional work, but Dr Burnard asserted the promotion of students' original music and sound work is a vital activity for music teachers, principals and assisting artists.

When children and young people compose, they are engaging with the materials of sound and the elements of music. As they progress and reflect on their work, they improve their ability to make decisions about these elements and begin to combine them to produce a desired effect. As they hear their work performed or played back, young people should be encouraged to reflect on what they can improve and what jelled, took shape and worked well. It is necessary to balance time for freedom, exploration, experimentation and improvisation with control, judgement and evaluation. Through this process, young people develop insight about the creative process.

Research

I spent the afternoon at the Education Library reading from a forthcoming publication *Music Education with Digital Technology*[26], edited by Dr Burnard with contributions from both academics and practising teachers. I also came across other research initiatives such as BERA (British Educational Research Association) and Futurelab that are worth noting for their relevance to my project.

Alex Baxter's chapter in *Music Education with Digital Technology* titled, "The Mobile Phone and Class Music: A Teacher's Perspective" is interesting as he charts the development of a Year 9 music class. This digital project was an attempt to, "inspire a cohort of students who showed a lack of enthusiasm for their music lessons" and it was the first time they had used technology in class. The project involved the students composing music in genres they interacted with outside of school such as grime[27], r'n'b and hip hop using "Reason" software and uploading the finished product in

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25 Refer to Works Cited.
26 To be published by Continuum, 2007.
27 A genre of UK electronic dance music that combines syncopated electronic beats with sub-bass basslines and often

mp3 format to their mobile phones. Baxter noted an increase in his students' motivation as they proudly showed each other and friends from outside the music class their work via their mobile phones – clearly an important object to them.

Dr Teresa Dillon is an artist-researcher interested in collaborative creativity, music, digital arts, open source and new media. Her chapter in *Music Education with Digital Technology* looks at collaborative music technology[28]. She writes about an over-emphasis in secondary schools on one or two pieces of expensive notation and/or sequencing software that can limit innovation and creativity as well as the collaborative potential of music technology. Musical co-construction is the "reciprocal process through which individuals co-develop a shared musical understanding of the task and their individual differences"[29]. It is important to have a shared physical space – either a keyboard, a graphic interface or other musical interface – where young people can both verbalise their ideas and enact them musically. Software like eJay and Acid allows young people to "see" their composition structure as it unfolds and "encouraged richer and longer verbal discussions" about the composition process. It was also conducive to the "continuous and cyclical creative processes of production, evaluation and redesign". This teasing out of the nature of the collaborative process and its relationship to composition and invention is valuable information for teachers embarking on composition projects with technology.

Dr Jonathan Savage is the research-educator behind innovative software applications such as Sound2Picture and Sound2Game. His chapter[30] looks at how the presence and use of ICT in the arts has the potential to challenge entrenched teaching practice, developing new pedagogical strategies for the future.

British Educational Research Association (BERA) is primarily an academic institution for educational researchers. An issue amongst academics, however, is the gap between emerging education theory and research and teaching practice within school environments. BERA is promoting the dissemination of new educational research to practising teachers through its accessible publication. It's short articles are written by teachers reviewing the current scholarly literature. It aims to be digestible for teachers with busy lives and crowded curricula. A recent issue titled, "How is Music Learning Celebrated and Developed?" gives an overview of the place of composition in British schools. Data gathered from OfSTED (Office for Standards in Education) together with a review of current literature led to the conclusion that original music work was not as prevalent as it should be.

Futurelab is an organisation dedicated to research and development projects in technology and education and also provides resources for learners and teachers. Current projects include: investigating the use of social, mobile, location-based applications such as PDAs[31] to support learning; development of the Create-a-Scape website that enables young people to create visual and sonic content as they explore different environments; Innovate to Educate, an initiative that partnered final year degree and postgraduate students from multimedia and ICT at Cambridge University with educators and encouraged them to develop a digital resource of benefit to education.

Other research at the University of Cambridge involved a PhD student investigating electroacoustic

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includes Afro-Carribean vocal "toasting" (like rapping) over the top.

28 Dillon, Teresa "Current and Future Practices: Embedding Collaborative Music Technogies in English Secondary Schools." in *Music Education with Digital Technology* Continuum 2007.

29 Dillon, Teresa (2006) "Exploring collaborative and creative processes using keyboard and computer based technologies in formal and non-formal settings". Unpublished PhD thesis, Department of Psychology, Milton Keynes: The Open University in *Ibid*.

30 Savage, Jonathan. "Pedagogical Strategies for Change" 2007.

31 Personal Digital Assistant – a small device that can store and retrieve data

composition in education.

Kirsty Body, Music Teacher, Spaldwick Community Primary School

On Tuesday 22nd May I visited Kirsty Body, Music Teacher at Spaldwick Community Primary School. The school is recognised in Cambridgeshire as striving for excellence in the area of ICT (information and communications technology). I observed Kirsty teaching a music lesson using the interactive white board and I also talked with her about the "Composer's Club", an extra-curricular group for senior primary students with instrumental music skills and an ability to read music.

David Ashworth: Music and ICT Education Consultant

I met David Ashworth at the British Library in London on Tuesday 22nd May. As Lead Consultant on Music and ICT for the National Association of Music Educators and advisor to Qualifications and Curriculum Authority (QCA) he was able to give me an overview of the status of music technology and creativity in British schools. It was a rewarding meeting. We discussed music and ICT, the potential for digital collaboration and future trends. David's ideas, together with the projects I had so far observed, strengthened my conclusions and recommendations.

Marcel Pusey, O-Generator workshop, Reading

O-Generator, designed by Marcel Pusey, is music software designed to teach the fundamentals of popular music composition. It uses drum, bass, synthesiser, brass, woodwind and vocal sounds in a range of popular music styles that users select before launching the program. The graphic interface is circular and represents four beats of the bar at 12 o'clock, 3 o'clock, 6 o'clock and 9 o'clock. Semiquaver subdivisions of the beat mark out the space between these points.

I observed Marcel run a workshop with Grade Six class at the Courthouse Junior School in Reading. The workshop also functioned as professional development for the music teacher. Marcel mentioned many teachers in their 40s and 50s were apprehensive about using software and that once they had seen him demonstrate the program, became more confident.

Creative Partnerships, Manchester & Salford

I met Nancy Barrett, Director of Creative Partnerships, Manchester on 24th May, 2007. I spent two busy days meeting people and observing different aspects of the Creative Partnerships initiative.

Creative Partnerships: Background

The importance of creativity in the curriculum at primary and secondary schools was highlighted in a 1999 UK government report, produced by the National Advisory Committee on Creative and Cultural Education (NACCCE), and chaired by Professor Ken Robinson. Creative Partnerships was launched in September 2002 in response to many of the recommendations made in the NACCCE report, titled, *Creativity: All Our Futures* (1999). Creative Partnerships is funded by the Department for Education and Skills (DfES) and the Department for Culture Media and Sport (DCMS). The initiative has been trialled successfully in sixteen of the most disadvantaged regions of England for the past five years. Creative Partnerships: Manchester involves Greater Manchester and Salford in its boundaries.

A creative partnership is not a superficial visit by an artist to a school, but a sustained approach that integrates the creative idea within a school and a community and involves joint planning and evaluation by all partners. In an idea that is similar to problem-based learning, an area of need is identified by staff, administration and/or students and that drives the subsequent program. It could be specific such as a need to improve memory retention in French or a lack of deep understanding in Biology or it could be a generalised need such as lack of engagement and motivation or challenging behaviours. If involved in a consultation process, young people will have their own ideas (see the Ellenbrook project below). The need may also involve teachers' skills whether or not the parent body is involved with their children's learning.

Goals

Creative Partnerships is driven by goals that aim to raise the aspirations and achievements of young people across curriculum areas through participation in long term creative projects. Through these partnerships, teachers' ability to work with creative practitioners are enhanced and aspects of whole-school improvement can also be addressed. The importance of embedding the creative partnership within the school's planning sets the initiative apart from other arts residencies. There must be a commitment on the part of the school administration, the staff and the parent community to adhere to the creative projects' aims, which are driven in the first instance by the needs of the school. Improving, developing and investing in young people's creative skills also builds the capacity of a locality's creative industries.

Tied into and behind the creative projects is a research and evaluation culture that looks at the nature of learning. Current learning practice is developed by:

- exploring creative risk-taking and innovation

- exploring what education for the 21st century might be

- evidencing and disseminating methodologies for creative learning

- developing the capacity of the cultural and creative sectors to work effectively in schools[32]

As methodologies are publicised and shared amongst researchers, creative practitioners, teachers and head teachers, young people and communities benefit from the invigorated pedagogy. Schools also become less isolated. Research into the long term effects on academic learning has found that young people who participated in CP projects outperformed their peers in the same schools[33]. These kind of results add weight to the relevance of Creative Partnerships' national program.

Ellenbrook School

This primary school has been in numerous creative partnership projects over a five year timeframe. All teachers and students have participated in a recent project where they designed, built and raised funds for the "Ellenbrook Chatterbox", a pagoda-like structure decorated with wrought iron panels forged by a blacksmith. The students had come up with the idea for a creative learning and play space in the middle of the school playground big enough to hold a whole class and where activities can be, "organised by the children for the children"[34].

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32 http://www.creative-partnerships.com/researchandevaluation/ accessed 26-09-07

33 "Final Report: The longer term impact of Creative Partnerships on the attainment of young people" National Foundation for Educational Research (NFER) 2006.

34 McNulty, John (2007), Headteacher, Ellenbrook School: "The Ellenbrook Chatterbox" notice to parents

Another creative project the school was involved in was and evolving display. Instead of displaying students' work as a finished product as is usual, they pasted up and took down drafts and fragments as their ideas evolved over the weeks. This was done as a whole class or in smaller groups. They had been able to see their thinking in action as they debated about what to leave up and what to take down. In this way I could see the display as a work in progress that the kids had control over. The classroom teacher I spoke to was amazed at how students who would normally give up quite easily, were persisting with their drafts and developing motives in an in-depth way.

Creative Partnerships: Conclusions

Creative Partnerships is an impressive initiative that has Federal support, is backed by current research, looks to the future and builds on a significant history in the UK of arts organisations sharing their expertise with schools and community centres. So far almost 250,000 young people have participated in over 4,000 projects, over 21,000 teachers have received training from Creative Partnerships and 3,500 creative practitioners and cultural organisations have worked with schools[35]. It is clear, from numerous published testimonials from teachers, artists and students and from action research undertaken, that the initiative is exciting, motivating, inspiring, rigorous and challenging. It integrates creativity and culture with other parts of the curriculum resulting in increased engagement as well as improved academic test results for young people. It attempts to make connections and augment relationships between school and the outside world fostering a sense of community.

Most importantly, Creative Partnerships provides a framework for new ways of learning to take place for all participants: young people, teachers, head teachers, parents and the wider community as well as the creative practitioners themselves. Professor Helen Storey, a noteworthy British fashion designer who has worked across disciplines as diverse as visual arts, fashion, biology and chemistry, as well as on Creative Partnerships projects, explains how learning can be expanded during the partnership process:

> Creative Partnerships has given me the privilege and means to work with the greatest of all materials, the human mind, and its potential. In a time when evidence and statistics have been everything, it continues to go after the brave stuff, the one thing our race cannot be without yet finds so hard to quantify; human imagination and purpose. Above all other initiatives I know, it offers partnered opportunities to out the intelligent approach, skills and qualities the next generation is going to need to deal with the planetary and humanitarian legacy this one has left it. Over the years, Creative Partnerships has added new meaning to my work.[36]

Creative practitioners can make visible and clear intelligent approaches to creating and solving problems to an audience that may previously have been in the dark about the how and why behind cultural artefacts in the wider world. The initiative is not only a one way flow of information, however. As Professor Storey attests, working closely with the next generation and their imagination has had its effect on her own practice. The creative practioner expands their collaborations from peer-driven practice to include intergenerational dialogue, surely beneficial to the growth and evolution of all.

As culture is constantly in flux, it can be difficult for schools to respond reflexibly and responsively to this climate and it seems logical to support educators with sustained parterships. The initiative responds to the needs of each individual school and finds creative practitioners and organisations that best address this need and who can work with the school for at least a year, possibly longer. In this way, the initiative can spearhead change and innovation across the whole school without being didactic. CP is a successful model for school growth that need not be intrusive or sudden

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35 "Creative Partnerships: Exciting Minds" Pamphlet published by Arts Council, England
36 Professor Helen Storey http://www.creative-partnerships.com/aboutcp/endorsements/ accessed 25-09-07

and has usually been a gradual process[37].Nancy Bennett mentioned teachers of all ages had responded positively to new and challenging ways of working. Headteachers must also be committed to the partnership and willing to set the tone for his/her entire staff and school community. If the head teacher and all staff are dedicated to using creative projects across the curriculum, it sets the tone. Young people perform better because they are motivated and engaged by their learning and they are participating in projects that value their voices and opinions. They begin to see links between traditional areas of the curriculum and the imaginative thinking involved in bringing a creative idea to fruition. Through this kind of participation, they may be able to visualise their future selves as vital contributors to culture, industry and media.

GMMAZ: Greater Manchester Music Action Zone

GMMAZ is one of Creative Partnerships: Manchester's partners but it also operates as a non-profit organisation. In the wake of the Music Manifesto[38] report, several organisations have focused their energies and resources to bring music, creative music making and music technology to as many students as possible. These partnerships are collectively known as "The Northwest Pathfinder" and they are one of three such initiatives in the country[39]. After their initial two-year funding period, the innovative project and modes of delivery trialled can be used as a model across the country. GMMAZ is part of four organisations in the Northwest Pathfinder and was set up in 2001.

I met GMMAZ's development manager, Sheni Ravji-Smith, for an interview. She was able to expand on GMMAZ's programs and talk about the role independent organisations can have in enhancing learning and motivation.

GMMAZ works with young people from housing estates in the Manchester/Salford region. It is for these young people, who are often demonised in the media, depicted with negative words and images, that GMMAZ brings its aim of creating projects and performances that break down social and musical boundaries[40]. During the process of working toward such events as *On Top of The World*, young people enter a journey of discovery as they uncover new and emergent abilities and talents in themselves, learn to work cooperatively with others and connect the musical culture they love with a positive learning experience.

On Top of The World

On Top of The World is GMMAZ's annual performance event. It is a coming together of high profile professionals in the DJ, MC and popular electronic music world, community music workers, voice teachers and composers to work with young people to create content for and produce an exciting performance at the Lyric Theatre in Manchester, a renowned performance space. *On Top of The World* includes diverse musical genres, both popular and classical, such as grime, dubstep, hip hop, r'n'b, pop, rock, soundtrack, and unites the skills of young beat boxers, MCs, DJs, drummers, vocalists and other instrumentalists in a theatrical multimedia performance. The words of Scott Owens, a young participant, are especially telling: "I know now that drums are my lifeline"[41]. His attitude reveals how meaningful participating in original musical experiences such as *On Top of The World* has been to his life in general.

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37 Nancy Barrett in conversation, 24th May 2007.
38 Established by the UK Government in 2004 to address the issue of music education for all
39 The other two Pathfinders are The Roundhouse in London and The Sage Gateshead in Cumbria
40 http://www.gmmaz.org.uk/about-1.php accessed 26-09-07
41 http://www.gmmaz.org.uk/ accessed 27-09-07

Gorse Hill Studios, Stretford, Manchester

Gorse Hill Studios is a community access facility that offers workshops and opportunities in music-making, dance, drama, film, digital arts and photography. Like GMMAZ, the organisation is affiliated with Creative Partnerships, Manchester. Gorse Hill Studios is managed by Trafford Youth Service through the Trafford Council.

Gorse Hill Studios contains a state of the art recording studio and a film editing suite. When I visited I was able to observe a young person at work in the studio creating a grime track. A professional audio engineer was available for assistance. Young people were able to hire the studio for 2 pound an hour. Originally, the use of the facilities had been free of charge but some of the funding sources had run dry.

Lee Higgins, Liverpool Institute of Performing Arts, Community Music, Liverpool

Dr Lee Higgins is based at Liverpool Institute of Performing Arts, housed in Paul McCartney's former high school. He specialises in community music and has set up an MA in Community Music that "conceives the community musician as a musician, an educator, a project manager and instigator, an evaluator, and a professional/entrepreneur"[42]. It was this broad conception of "musician" and the dynamic role a musician can play within a community that prompted me to set up a meeting with Lee. He had also been involved with a conference on technology and community music and has had experience facilitating music technology workshops. Patricia Campbell from the University of Washington alerted me to his work.

Lee provided me with a background to community music the UK. Community music grew out of community arts, which was embedded in sixties counter culture and, also framed by a Marxist school of social and political thought, quite radical in nature. It was a kind of resistance movement and pushed against traditional education system and other spheres of oppression. Also informing this movement were music educators like R. Murray-Schafer and John Paynter who saw the classroom as a space for creativity and personal liberation. The history of post-war community development shares a similar ethos.

By the mid-eighties the community music movement evolved to support formal employment roles called "animateurs". Animateurs were employed all over the UK and helped "animate" a community. It's established enough now to have a voice at policy level as part of reports like the Music Manifesto.

Community music is interventionist in nature — it has a socio-political function and can act as a force for positive change. It operates on the notion of equality of opportunity and access. It inhabits spaces like the classroom, the workshop, the street, the festival and uses facilitators as a mechanisms to allow the community's voice to flourish. The American term for it is Community Cultural Development. Projects can occupy different time scales from one hour in the classroom to many years within a community. The notion of empowerment is big in this area but recent thinking in community arts in the UK is scrutinising the term and processes around it, finding that unless workshop facilitators/educators are self-critical and aware, the "empowering" can actually preserve existing power structures (along gender/ethnicity/class lines). The needs and ambitions of the participants in any given situation are taken as a starting point rather than those of the teacher or facilitator[43]. The reality and diversity of young people's experience needs to be taken into account

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42 http://www.lipa.ac.uk/standard/postgrad/macommmusic/index.htm accessed 17-08-07
43 Community Music Activities commission, ISME (International Society for Music Education)
   http://www.cdime-network.com/cma accessed 17-08-07

when planning projects and activities. Once identified, the facilitator or project leader should have well-established skills in the chosen area.

Sonic Postcards: Stonehaven, Aberdeenshire, Scotland

Despite the incredible listening ability of most humans, sound in our environment often goes unnoticed unless it is an annoyance, a mobile phone ring or a knock at the door. Yet we make judgements about our position in space and our safety based on auditory information received on an almost daily basis. Usually these judgements are combined with optical information, however, and the dominance of the visual sense remains unsurpassed. The result is that humans with their hearing and sight intact will default to vision as a way of experiencing the world and potential sensitivity in hearing is dulled. Sometimes this is necessary: there is so much sound produced by human activity out in the world, that we are in the habit of simply blocking it out so we can go about our lives. But there is also a loss as we take the remarkable hearing mechanism for granted.

Sonic Postcards is a project from a national organisation of professional sound artists and composers, the Sonic Arts Network, that attempts to resolve this unbalance between the visual and the auditory. It partners sound artists with young people in schools for some short-term projects with long-term implications. Young people explore their local sound environments, make field recordings and manipulate them in their digital form. The outcome is a "sonic postcard" a sound imprint of their locale. Postcards are uploaded as mp3s to the Sonic Postcards website and an exchange takes place between two or more schools in different parts of the UK. Further learning opportunities can be mined from the project as teachers and students explore activities that address ICT, geography, the environment, literacy, social studies and visual arts. Less obvious links to biology, citizenship, maths and physics have also been made with careful planning by teachers involved[44]. Partnerships with environment organisations such as the Royal Society for the Protection of Birds (RSPB) and Scottish Natural Heritage have also taken place, further securing the connection between sound and environment, sometimes referred to as acoustic ecology.

I spent two days with sound artist and composer Pippa Murphy at Arduthie School in Stonehaven, a small beach town in Aberdeenshire, northern Scotland. Pippa had spent the previous week helping the class of Grade 4s and their teacher prepare, embarking upon sound walks, doing listening exercises and identifying "soundmarks" that make Stonehaven sound unique. Certain exercises were done as homework: draw the sounds you can hear when you are in your bedroom, the kitchen, out in the yard. By the time I took part, the class was well primed on their local sonic environment and had very clear opinions about what sounds to record and where. My first day involved two different walks where field recordings were made. A digital audio recording device, the iRiver, a directional microphone and headphones were shared between a group of five. In order to make the most high quality recordings, the entire class stopped at the sound source and Pippa counted down so that everyone pressed record at the same time. In this way, most groups were able to capture the environmental sound without unwanted talking. Before the recordings took place, Pippa had rehearsed the class in the ritual of arming the iRiver to record on standby, so that a simple pressing of the play button starts the recording at the desired time.

Several distinctive sounds made an impression on the Arduthie School's young people. Auntie Betty's sweetie shop, an old fashioned "goodies" shop on the beach front where Leslie, the sweetie shop owner with a theatrical voice gave a run down of the sweets available in the store. The art deco Carron Restaurant had a nickelodeon, an automatic piano with glocks, drum, tambourines and woodblocks inside. Other sounds recorded included ducks, pebbles, the prisoner's wheel, fisherman's clogs and an old washing machine in the Tolbooth Museum, the river, waves, children

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44 Sonic Postcards booklet published by Sonic Arts Network

playing, a pram on cobblestones, and a horse clip clopping on the road

Pippa presented a workshop on Audacity, free audio editing software, on the second day. Audacity was projected onto the interactive whiteboard and with Pippa's guidance, the class made a sonic postcard by selecting certain recordings from the previous day and combining them in interesting ways. One half of the class then used the ICT suite to make their own sonic postcards, followed by the other half. The students enjoyed this part of the project so much and could have easily spent more time making their postcards. Nonetheless, the final outcome from all was a powerful result. As we listened to them, the students' creations evoked a nostalgic image of a Scottish beachside town.

Tony Whitehead, Shaugh Prior Primary School, Totnes, Devon (Aune Head Arts)

Tony Whitehead works for the Royal Society for the Protection of Birds and is also a sound artist. He has been a workshop leader for Sonic Postcards in the past but I met him working on a similar project for Aune Head Arts, a community arts organisation in Dartmoor, Southwest England. I initially contacted Tony in regards to his use of Audiomulch, real-time sound processing and synthesis software, with primary age students. Developed by Melbournian Ross Bencina, Audiomulch has gained popularity amongst electronic and experimental music makers around the world. I was interested to see a sound artist use Audiomulch with a younger audience.

Shaugh Prior Primary School contains 18 pupils in total and is located near Dartmoor National Park in a rural setting. The project followed a similar model to Sonic Postcards but differed in its output. Audiomulch has the ability to load multiple sound files and map them to different locations on a screen view called the Metasurface. Through the projection onto the interactive whiteboard, the kids were able to come to the board and touch desired locations to hear their recorded sound. This was a unique way to compose with sound in the moment. The visual interface engaged the students and they moved their finger on the board in slow, quick and zig zag trajectories to create with their own sound environment pallette. Audiomulch, when used in this capacity with the interactive whiteboard, turned into an engaging new musical interface for expression and creation.

OTHER INITIATIVES: UK

Musical Futures and NUMU

Musical Futures is a project funded by the Paul Hamlyn Foundation in association with Youth Music and the Department for Education and Skills' Innovation Unit. It provides resouces for teachers and young people. One such resource is David Ashworth's "Electrifying Music: A Guide to Using ICT in Music Education"[45]. A particularly worthwhile initiative is NUMU, a dedicated online space for schools and community organisations to inhabit. It provides students with the tools to create their own web pages where they can publish original music, video and images[46]. Once accounts are set up, young peope, teachers and creative partners can upload original content as well as connect with other schools and community groups.

FACT: Foundation for Art and Creative Technology, Liverpool

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45 January 2007
46 http://www.numu.org.uk/numuhq/faq.asp accessed 29-09-07

I visited FACT, an organisation for the commissioning and presentation of film, video and new media art forms, while in Liverpool. It's striking architecture housed innovative media art. FACT derives some of its income from showing current-release films, which allows for artistic freedom in its programming. It is also used as an educational and community resource. It's successful "Tenant Spin" project, a community television initiative for tenants in housing estates, has been recognised internationally for its innovative use of new media in a community arts project.

PART III – LESSONS

CONCLUSIONS

- Creative skills will be among the most sought after in future workplaces across all industries (especially business and the private sector). Raising literacy and numeracy standards are important but education needs to encompass far more if it is to help prepare young people for a complex future. In addition to academic qualifications, employers are looking for qualities such as creative skills, ability to communicate, empathy and social skills[47].

- A 21st century curriculum must respond to students in a relevant and meaningful way, in a way that captures the excitement and enthusiasm they have for music outside of school and that can be transformed into learning.

- Education and pedagogy must continue to evolve in order to meet the needs of our future citizens. Partnerships between schools and creative practitioners, teachers and academics, technology professionals and educators will assist in this moving forward.

- Long-term partnerships that are built into schools' planning can enable a degree of whole-school change where students, teachers, parents and a community benefit. Partnerships can support and help develop teachers' own creative skills.

- Student voiced activity plays a large part in engagement and feelings of belonging at school and young people are motivated by activities and projects where they are able to contribute and create content.

- Digital projects in music are relevant. Young people should have an opportunity to create new music and projects using some of the technological tools that are so familiar to them. In this way, they are developing a critical awareness that the "tool" can be manipulated for a particular purpose: they build an active rather than passive relationship with technology and software.

- The development of new tools is also important. New interfaces for musical expression have a hand in infuencing new musical forms in the way the development of the piano impacted on compositional forms and new modes of expression in the 19th century. The interactive devices of today have a particular benefit to disabled populations and people of limited mobility as they assist in the experinece of music creation in a hitherto unexplored way.

- Connections should be encouraged between scientific and technological research, the arts and the creative industries and education.

- Peer teaching is an under-utilised strategy when working with technology in classroom situations.

- Learning outcomes must be clear before embarking on a project with technology. We must be clear about what we are using the technology *for.*

- Creative development can be assessed. A good working definition of creativity: imaginative activity with purpose (NACCCE: all our futures).

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47 "The Challenge for Education" NACCCE Report, paragraph 5, 1999

- Artists and other non-education trained personnel need adequate support and introductory training before taking on roles of responsibility in educational settings, especially in regard to behaviour management.

- Young people are citizens in their own right and their experiences, opinions and ideas are valid. Any project with young people must acknowledge their ability to express opinions and influence decision making[48].

- The need to produce results of a certain standard should be balanced with opportunities where young people and participants can experiment and generate new ideas and where there is not such an emphasis on perfection. The creative process is a process; there is a time and a place for refining and polishing and honing one's skills. However, if teachers, artists and/or role models expect too much too soon, there is a risk that the young person may give up, think the creative endeavour too hard or become disengaged. The process needs to be scaffolded.

- The sonic environment contributes to a sense of place and space and as such, the perception of sound is important to a community's identity. Recording sound and working with it in its digitised form can produce aesthetically rewarding results, as a sonic document of a place. During the recording and editing process, listening becomes more acute.

- Popular music styles are important to young people's identity and should be included as curricular material. Genres such as hip hop, drum'n'bass, grime, techno and r'n'b lend themselves to electronic exploration.

- Creative music making in the classroom can be seen as an intervention in lives and can act as a force, potentially a catalyst for positive change. When technology is brought together with creative music making there is both a chance to engage students in learning and develop important skills that reach across the curriculum and beyond.

- When young people are motivated by immersing themselves in projects that include their varied learning styles, their ability to perform in other subject areas often improves. Achieving success and feeling a sense of pride in an original creation improves self image as a learner. This improved self esteem can begin to resonate in other school areas where it once did not.

- The sonic realm may be a young person's preferred mode of expression. The expression of ideas, emotions and thoughts via sound and music can successfully carry messages that were not so easily conveyed with words.

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48 This view is in line with United Nations Convention on the Rights of the Child (1989) quoted in Bragg, S "Consulting Young People: a Review of the Literature" Arts Council, England (March 2007)

DISSEMINATION

Students & Parents

Reflection on my teaching practice reveals a need to continue developing and evolving my current curriculum and learning environment for my students' benefit. My music program will aim to achieve some of the following as a result of my Fellowship:

- Setting achievable ICT goals for students at all levels
- Capitalise on many students' tacit understanding of ICT by becoming familiar with relevant hobbies
- Support and opportunities for peer-to-peer learning[49]
- Promoting enjoyable and educational ICT music activities that may be accessed beyond the classroom, at home and at little cost. Through the school's website, school newsletters and on my forthcoming website.
- Opportunities at all levels for focused creative activity
- Exploring and discussing with students ways to link imagination with sound
- Clearly communicating aspects of creative behaviour to students and including these as explicit criteria in their assessment rubrics[50]
- Celebrating students' creative achievements by showcasing them at school, on the website and in the community.
- Choosing portfolio assessment tasks that inform parents about key creative achievements with information about why those creative achievements are relevant and important
- Research community organisations and local artists for potential partnerships. A partnership with a DJ or a hip hop artist from the local community could spark a long-term alliance
- Sourcing and making available at the school's front office information on music and technology in the Broadmeadow's area[51]

Teachers

Information will be disseminated to teachers in the following ways:

- Through digestible information on my forthcoming website with links to appropriate reports, schemes of work, ideas for partnerships, music advocacy and affordable, accessible software
- Through a link from the Northern Metropolitan Region's (NMR) official website
- Through articles sent to publications like *Music in Action* (a national music education magazine), *The Education Times* (Victorian Department of Education fortnightly newspaper), *The AEU News* (Australian Education Union magazine)
- Through attendence at an ASME conference (Australian Society for Music Education). I intend to give a paper
- Through daily interactions with staff at my school, with other music teachers at regional network events, and with the NMR's Music Coordinator

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49 While this already happens a great deal in my classroom due to a high proportion of group work activities, I could utilise this more formally during an ICT lesson.

50 See Burnard, Pamela "Progression in Creative Learning" & Creative Partnerships "Assessing Creative Development" for details

51 For example, the Broadmeadows Global Learning Centre has an array of technology resources for the public to access

Arts Workers and Organisations

Information will be passed on through:

- Personal interactions with arts professionals at symposia, conferences and workshops
- Forthcoming presentations to be given at Arts Victoria
- Making professional links with progressive Australian initiatives such as Soundhouse at the Arts Cetre, ArtPlay at Federation Square and Australian Centre for the Moving Image
- Encouraging existing arts in education programs (such as Musica Viva and Arts to Go) to include projects that use technology
- Initiating community access projects that enable participants to compose and create using digital technologies in Frankston and Broadmeadows

Software and Hardware Developers

Information will be passed on through:

- Attendance and interaction with participants in Melbourne's monthly Dorkbot presentations – a forum for developers to showcase their work in new areas of technology, computing and interface design
- Attendance and interaction with participants from a monthly event at SIAL (Spatial Information and Architecture Laboratory), RMIT University that encourages the development of new artistic practice through engagement with technology in different art forms
- Encouraging interested colleagues to develop new ideas, projects and devices for young people to use in education and community settings
- Alerting interested lighting, sound and multimedia designers to register with Arts Victoria artist register, an artist in residence initiative

RECOMMENDATIONS

Schools

- Musical compositions need prominent space in schools. Students' composition can be used as bell music[52] and as entry and exit music to assembly. Compositions need to be performed or recordings of original digital work played publicly on a regular basis. The student voice needs to be part of the school organisation.

- The creative arts need to be integrated into every young person's learning and development. Creative arts teachers and their programs should be promoted as a resource for all staff and students. Communication between classroom teachers and creative arts teachers should be encouraged through the allocation of adequate time and space in staff meetings and during schools' strategic planning.

- Teachers and creative practitioners should model creative thinking. Aspects of creative and imaginative behaviour should be clearly communicated to young people verbally, and in the form of rubric assessment.

- Classes from different schools (both local and international) should make contact and collaborate on creative digital projects[53]. Resources could be shared and, most importantly, a creative idea can grow amongst young people from diverse backgrounds. School administrations should support this by accomodating necessary timetabling changes and promoting the finished product publicly.

- Creative work needs time to develop and evolve. Teachers and school administration should enable adequate time for young people to engage in this creative learning.

- School administration and IT support should prioritise the implementation of music technology within the school's organisation. Specialists are sometimes forgotten or not included in a timetabled roster of access to a computer lab.

Creative and Technology Industries

- A dialogue should take place between music/arts educators and interactive instrument designers and software developers so that educators are not just at the receiving end of a marketing campaigne.

- Research and development in the area of educational technology should take account of the need for products to be convenient, cheap and mobile.

- Professionals in the creative and technology industries should consider sharing their expertise by mentoring schools and young people where the outcome is a creative digital project.

- Professional organisations and individuals partnered with young people can demonstrate a

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52 Many primary schools use recorded pop songs over the PA two minutes prior to the bell.

53 An example of these kind of collaborative projects are: remixing each others' music, extending and reworking recordings of each schools' respective sound environments, creating soundtrack and sound effects to the other schools' animation or claymation, providing original beats for the other school to invent dance to etc.

high standard in their field. It is also important to let the work created by young people speak for itself. Their original work reflects a younger voice.

Policy

- The development of a policy framework for creativity should be considered at the state and federal level

- A framework for long term creative partnerships should be built into arts and education policy at the state and federal level. The framework should allow for the integration of creative projects into all areas of the curriculum and should support education to meet new learning challenges in our current climate.

- A scheme that allows arts and technology students (digital music, fine art, media arts, software and website design) to be placed in schools as part of their degree should be developed. This would allow an innovative exchange of experience and expertise.

- Tax incentives should be given to organisations and individuals in the creative industries willing to share their expertise with schools and who can act as mentors

- The Department of Education should establish the importance of creative digital education amongst all state principals. The provision of dedicated professional development for teachers to develop skills in the area of digital creativity should be noted

- Inexpensive, alternative forms of software for use in education should be publicised and promoted. Additionally, information about where to source such applications and suggestions about how they may be used in classrooms will be found on my forthcoming website.

Appendix 1

Qualifications and Curriculum Association's (QCA) *Features Associated With Creativity*

Table 1

Features associated with creativity (QCA) *'Imaginative activity fashioned so as to produce outcomes that are both original and of value' (All our Futures, 1999)*		
Imagination and purpose	*Imagination directed at achieving an objective*	
Originality	*Tackling questions, solving problems and having ideas that are new to the learner*	
Value	*Value in relation to purpose – judged through critical evaluation*	
A range of behaviours		
Questioning and Challenging	Asking why, how, what if? Responding to ideas, questions, tasks or problems in an unusual way	Asking unusual questions Challenging conventions and assumptions Thinking independently
Making connections and seeing relationships	Recognising the significance of knowledge or previous experience Generalising from information and experience, searching for trends and patterns	Using analogies and metaphor Reinterpreting and applying learning in new contexts Communicating ideas in novel or unexpected ways
Envisaging what might be	Imagining and seeing things in the mind's eye Asking 'what if?' Visualising alternatives	Seeing possibilities, problems and challenges Looking at and thinking about things from different points of view
Exploring ideas, keeping options open	Playing with ideas and experimenting Responding intuitively and trusting intuition Keeping an open mind, adapting and modifying ideas to achieve creative results	Trying alternatives and fresh approaches Anticipating and overcoming difficulties, following through ideas
Reflecting critically on ideas, actions and outcomes	Reviewing progress Inviting and incorporating feedback Making perceptive observations about originality and value	Asking 'is this good, is this what's needed?' Putting forward constructive comments, ideas, explanations and ways of doing things

Melanie Chilianis – Churchill Fellowship 2006
Source: Dr Pamela Burnard, Cambridge University

Appendix 2

Table 2, from a research symposium at Cambridge University defined creative learning as:

Key features of creative learning emergent from Cambridge Symposium 2005

Table 2

Conditions	Experience of the unknown, multi-modality, a learning leap
Pupil behaviours	Immersion, playfulness, risk-taking, insightfulness, agency
Pupil stance	Self-determination, agency
Processes	Imagination Divergent thinking Generativity

Source: Cambridge Symposium: Documenting Creative Learning, April 2005

WORKS CITED

Ashworth, David. "Electrifying Music: A Guide to Using ICT in Music Education", Paul Hamlyn Foundation, January 2007.

Ashworth, David. Personal interview. Tuesday 22nd May, 2007.

Berry, Oliver. "Creative Computing" *Arts Professional* 29 August 2005.

Burnard, P., Craft, A., Cremin, T., with Duffy, B., Hanson, R., Keene, J., Haynes, L. & Burns, D. "Documenting 'possibility thinking': a journey of collaborative enquiry" *International Journal of Early Years Education* Vol. 14, No. 3, October 2006.

Burnard, P., Craft, A., Grainger, T. & Chappell, K. *Progression in Creative Learning (PICL Pilot): A study funded by Creative Partnerships* Milton Keynes: The Open University, January 2006.

Burnard, P & Finney J, eds. *Music Education with Digital Technology* London: Continuum, 2007.

Campbell, Patricia. Personal interviews. Monday 23rd to Thursday 26th April 2007.

Creative Partnerships *Assessing Creative Development*, Teacher Resource, Sunderland: Arts Council England, 2004.

Creative Partnerships. *Creative Partnerships* Arts Council England brochure.

Creative Partnerships. *Research and Evaluation* http://www.creative-partnerships.com/researchandevaluation/ accessed 26th September 2007.

Final Report: The longer term impact of Creative Partnerships on the attainment of young people, National Foundation for Educational Research (NFER) 2006.

Futurelab. http://www.futurelab.org.uk.

Gilbert, John. Personal interview. 16th May 2007.

GMMAZ. http://www.gmmaz.org.uk/ accessed 26th September 2007.

Greater Manchester Music Action Zone. *On Top of the World 06/07* pamphlet from Sheni Ravji-Smith.

Harvestworks. http://www.harvestworks.org/ accessed August and September 2007.

Higgins, Lee ed. *Community Music and New Technology* Conference Report, Liverpool: Liverpool Institute for Performing Arts, 1999.

Higgins, Lee. Personal interview. Wednesday 30th May, 2007.

International Society for Musc Education *Community Music Activities* http://www.cdime-network.com/cma/ accessed 17th August 2007.

Laurence, Becca. Personal interview. Tuesday 29th May, 2007.

Liverpool Institute of Perfoming Arts (LIPA). http://lipa.ac.uk/ accessed 17th August 2007.

Manhattan New Music Project. http://www.mnmp.org/.

McNulty, John. "The Ellenbrook Chatterbox" newsletter to school community, May 2007.

New York State Education Department. *Arts Standards*
http://www.emsc.nysed.gov/ciai/arts/artstand/arts1.html accessed 3rd May 2007.

Playbill "Victory is Justice in the Hood", Queens School for Career Development, New York, May 11th 2007.

Reinhart, Julia. Personal interview. Tuesday 3rd May, 2007.

Rigler, J and Seldess, Z. "The Music Cre8tor: an interactive system for musical exploration and education" *Procedings of the 2007 Conference on New Interfaces for Music Expression (NIME)*, New York, NY, USA, 2007.

Sonic Postcards: A Sonic Arts Network National Education Programme pamphlet from Becca Laurence, Development Director, Sonic Arts Network, London.

Sonic Postcards booklet published by the Sonic Arts Network, London.

United Kingdom Department for Education and Skills. *Music Manifesto Report no. 2: A Consustation for Action* London: DfES Publications, 2004.

United Kingdom Department for Education & Employment and Department for Culture Media & Sport. *National Advisory Committee on Cultural and Creative Education (NACCCE) Report* to Secretary of State for Education and Employment
and the Secretary of State for Culture, Media and Sport, 1999.

Welch, Graham F. & Adams, Pauline. "How is Music Learning Celebrated and Developed?" Notts: British Educational Research Associaiton, October 2003.