Embedding Digital Technologies
In The Music Classroom:

An Approach for the New
Music National Curriculum

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Embedding Digital Technologies in the Music Classroom:
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1. INTRODUCTION

Digital technologies are increasingly being integrated into the fabric of human society (Joy 2000). As part of this trend, they are increasingly being used to support and restructure education in schools (Sheingold and Tucker 1990; Barbara Means, John Blando et al. 1993; Bates 1999). Recent research also demonstrates that many digital technologies are being used to support the implementation of musical curricula (Burnard and Finney 2007). The aim of the unit is to demonstrate a working out of the key concepts from the National Curriculum, into realistic classroom activities that promote learning through the integration of Digital Technologies.

1.1. DIGITAL TECHNOLOGIES IN MUSIC EDUCATION

Digital technologies have been a notable feature of each successive revision of national curriculum (DFES 1988; DES 1992; DFES 2000; QCA 2007) and GCSE specifications (DES 1985; Edexcel 2000; OCR 2000; OCR 2005; Edexcel 2006; QCA 2007; OCR 2008). However, such is the rate of change and development systems that assist in the conception, recording, manipulation, storage, transmission and consumption of vast qualities of information, some of it related to music; that any current review of these developments is immediately destined to be obsolete (McLoughlin 2002; Spector, Merrill et al. 2008). Although now over five years old, Pitts and Kwami’s (2002) survey of 18 secondary schools suggested that the most widespread use of digital technologies was during computer-based composing at Key Stage 4. Pitts and Kwami’s study presents the computer as a tool and simulator for assisting the process and testing hypothesis. This view concurs with a wider body of research which reveals a limited application of technology in school classrooms (Mooney, Fewtrell et al. 1999; Reese 2001; Steffens and Jedermann 2001; Ruthven and Hennessy 2002; Ruthven, Hennessy et al. 2004; Thomas 2008).

If we are to make the most of the opportunities that technology affords us then a broader view of technology is needed. Such a view would attend not only to well established methods, software resources and hardware solutions; but also to new and developing trends. To define the scope of this exploration of some new and developing trends I suggest a definition of digital technologies that is in line with the notion of a musical curriculum and consistent with current research on school based composition (Webster 2007; Burnard and Younker 2008; Gall and Breeze 2008; Ruthmann 2008). Digital technologies that can be useful in music education are systems that:
“encourage active learning, knowledge construction, inquiry, and exploration on the part of the student, as opposed to being exposed to information delivery systems” (Greaesser, Chipman et al. 2008: 211).

Before turning to how digital technologies can be used to help provide students with a meaningful musical education we will review what this idea of a ‘musical’ curriculum might be within the context of the new music national curriculum.

1.2. A MUSICAL CURRICULUM

Many writers have discussed the idea of a musical curriculum (see Mills, 2005; Swanwick 1999). However, the key aspects I wish to pick up on are those that clearly emanate from the new National Curriculum. Within this context, a musical curriculum can be thought of as one that:

- a) builds upon students’ previous experiences and
- b) provides new practical, integrated and collaborative activities.

This perspective seeks to emphasise the idea that musical experience is something that all people have. A ‘musical’ curriculum engages all students in “doing music: making it, creating it, responding to it” (Mills 2005 p2).

At the same time, it is clear that music in school should flow from the key concepts outlined in the statutory content of the curriculum documentation. Pupils knowledge, skills and understanding in and of music depends upon these ‘concepts’ or aspects of music: Integration of practice, Cultural understanding, Critical understanding, Creativity and Communication.

One useful way of thinking about these concepts is to draw on Christopher Small’s proposal that music should be viewed as an ‘act’ and not a ‘thing’. The act of musicking (Small 1998) focuses on performing, not the performance, composing and not the composition and listening, not ‘the sound’. He suggests that the term musicking could be used to describe every meaningful act related to music. In a western classical context this could include performers, concert organisers, the audience and even program sellers. This is helpful because we can begin to see the relationships between the many different aspects (key concepts).

When children compose meaningful music, they are involved in a dialogue between the individual as composer and listener, the emerging work, the culture that has produced the composer and the setting in which the transaction takes place (Barrett 2003). Figure 1.0 brings together these relationships; between the individual as musician and composer, the work, the culture and the setting. Interactions occur
both clockwise, anti-clockwise, and along the radii as illustrated by the gradually blending colour palette.

The key ‘activities’ of a musical curriculum are performing, composing, listening and collaborating. Another way of thinking about them is creating, making and responding individually and as a group (central section). To make a piece of music in a way that integrates composing and performing you first have to create it! Also, when this music is created and made both in a group or as an individual there will undoubtedly be a response to it!

When making music it is common practice for teachers to provide instruction that can help to guide to students. Too many options can hinder the creative process. Structured problems, such as a predefined brief or carefully selected instruments, can help individuals to start from their experience and introduce constraints that can guide the process of decision-making (Johnson-Laird 1988). At the same time new experiences, sounds, instruments, people or other artworks can provide stimuli that keep things fresh and exciting. Different local, national and international musical tastes, traditions and tools provide an unlimited supply of such stimuli. Understanding about other musical settings and cultures only becomes meaningful

Figure 1.0: Meaningful musical activity in the secondary classroom
when students can link this to their own identity and experience through active engagement.

To gain personal understanding or ‘meaningful musical understanding’, students need to be given the opportunity to respond to ‘music’ as realised art. This requires a performance of ‘the work’ over time and within a context (Toynbee 2003). Within this setting the culture that provides the stimulus and structure for the problem can then be compared critically with the setting and realisation of the finished work. It is my experience that responding to ‘a work’ without first providing a performance point from which to ‘view’ it; will produce judgements that degenerate into posturing. In this way, contexts (settings) and styles (cultures) are used to inform judgements.

The balance between creativity and communication is an important one. For music to be meaningful to students, they require the freedom to build musically upon both existing understanding and new experiences. At the same time, for realisations of musical ‘works’ to be meaningful to others, they must balance their own experience with that of their audience (Cook 1990; Toynbee 2003). Existing music knowledge, skills and understanding can be used in new settings and through the eyes of different tastes, traditions and tools. For example students could use their knowledge of Baila (Sri Lanka) and their recent work on Shakespeare’s Comedy of Errors as stimulus for a classroom Waada Baila (contest). However, be cautious because if the new context removes all chance of translation for the audience then the meaning will be lost on all but the composer.

It is clear that proving a musical curriculum that attends to the individual experiences of each in class of about 30 very different students is no small task. Yet, because a musical education has its roots in practical activity, digital technology offers several avenues to explore that may prove fruitful when used in a busy classroom.

1.3. DIGITAL TECHNOLOGIES IN SUPPORT OF THE NATIONAL CURRICULUM

Recent music education literature on the use of digital technologies reveals several different technologies that can be used to support the implementation of a musical curriculum. We begin to examine how such technologies can assist in musical education by grouping them into the following categories: Mobile systems (MOS), Web based services (WBS), Computer-based tools (CBT) and Hardware/user interfaces (UI). Broadly speaking the potential of these categories are summarised in table 1.0.
Table 1.0: Types of digital technologies and their definitions

<table>
<thead>
<tr>
<th>Technology type</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile systems</td>
<td>Allow access to digital data and communications platforms from small devices that can be easily transported between different locations.</td>
</tr>
<tr>
<td>Web based services</td>
<td>Have broad applications, which draw on the internet’s storage, communication/presentation, transmission and search capabilities.</td>
</tr>
<tr>
<td>Computer-based tools</td>
<td>Provide specific functions within software environments directed at the completion of tasks more effectively or more efficiently.</td>
</tr>
<tr>
<td>Hardware or user interfaces</td>
<td>Provide for individuals or groups means of interaction with the digital technologies. It should be noted that some hardware interfaces are still analogue, and thus fit outside our notion of computer-based technologies. However, these interfaces are increasingly based around digital microprocessors.</td>
</tr>
</tbody>
</table>

In her discussion of the opportunities presented by mobile technologies, Baxter (2007) presents the mobile phone as a platform which enables students to store and transport their composition products as mp3’s for listening outside the classroom. It is reported that the use of phones in this way coincided with large numbers of students working collaboratively in ways such as; listening to and offering critiques of peers’ developing ideas, making comparisons with professional works, internalising musical phrases, rehearsing performances and selecting sounds. Baxter notes that students were able to take pride in the music they had produced (p.59) and were motivated to create work outside the curriculum timetable. It is fair to conclude that mobile technologies offer a way to make links between students’ musical experiences inside and out of the classroom. Baxter’s work suggests that mobile technologies provide opportunities for individual and collaborative work, permit the integration of practical activities and foster student motivation through positive interactions with the subject.

Seddon’s (2007) study of the ‘Musit Interactive’ music sequencing package, a tool based program which has an added feature enabling text communication within the package, found that participants with no prior experience of music-sequencing were able to compose collaboratively via email. They created finished compositions within six 25 minute sessions. Networked environments such as *jam2jam* (Dillon and
Brown 2007) also allow remote interaction. However, rather than occurring over long periods of time, interactions over jam2jam are in real-time. Such an improvisational approach requires performers to listen and compose simultaneously, responding immediately and collectively to the the compositional ideas they implement. Both e-learning and networked environments present opportunities for creative collaboration, promote positive interaction with music and support the integration of listening, composing and performance skills.

Several studies have investigated potential benefits which hardware and user interfaces offer to the secondary music classroom (Reese 2001; O’Neill and Seddon 2003; Reynolds 2003; Gall and Breeze 2005; Field 2007; Gall and Breeze 2007; Kirkman 2007). Kirkman (2007) found that, while MIDI can be a way of allowing students access to new ways of working, an over-reliance upon keyboard-type interfaces means that the potential offered by different hardware is not widely realised. If the MIDI capabilities of a computer based system are accessed only through a music keyboard, computer keypad or mouse, then this puts non-keyboard instrumentalists or non-instrumentalists at a disadvantage. Recent publications in support of computer-based technologies in the secondary classroom still demonstrate a worrying lack of diversity in the hardware and user interfaces employed in secondary classrooms (Pitts 2005; Ashwforth 2007; Ruthman 2008; Savage 2008; Thomas 2008; Tobias 2008). As well as MIDI devices, interfaces such as interactive whiteboards, computer projectors, microphones, speakers, effects modules, mixers and turntables provide a wealth of opportunities for collaborative music making. Hardware user interfaces facilitate greater access to the benefits of web-based technologies and computer-based tools by offering different modes of interaction (eg. visual, spatial, gestural, linguistic) and opportunities for collaboration.

A final group of technologies that offer support to musical curriculum practice are computer-based tools. As mentioned previously, computer-based tools are by far the most widespread application of digital technologies in secondary music education (Reese 2001; Pitts and Kwami 2002; Reynolds 2005). Folkestad’s influential study of secondary aged music students composing using computer-based tools was conducted in an informal context outside school(Folkestad 1996; Folkestad, Hargreaves et al. 1998). However, the aim of the research was to investigate individuals’ processes of computer-based composing. Folkestad et al (1998) conclude that all the participants succeeded in creating music, irrespective of their level of musical experience. This notion is supported by Seddon & O’Neill (2003) who note that, while formal instrumental music training may influence the process of composing, all 48 students (aged 13-14 years) in their study were able to create music effectively. More recently Gall & Breeze (2005; 2007; 2008), demonstrate that contrasting computer-based tools (Dance E-Jay, Cubasis, Cubase VST) provide opportunities for collaboration (2005 p.426). Of particular importance at secondary
level is the way that these collaborative opportunities do not preclude the resulting composition being the result of decisions made by an individual student. In this way such tools may help to overcome any tensions between the value of group work in promoting musical working and assessment requirements.

The types of technologies discussed above can be integrated into systems that provide greater flexibility and access. A study that demonstrates the efficacy of such integration in secondary contexts is the Savage and Challis’ (Savage and Challis 2001; Savage 2003) Dunwich Revisited project. The study was a KS3 and GCSE composing project that culminated in a performance at a local concert hall. This project included mobile systems (a MiniDisk player), computer-based tools and hardware user interfaces. Digital technologies present many different opportunities to effectively support a curriculum which builds on students’ individual musical experiences, fosters collaboration and provides opportunities musical working.

Table 1.1 presents further examples of each technology type from the current literature on digital technologies in music education. A recent collection of articles drawn together by Burnard and Finney (2007) presents a promising picture of existing and potential uses of technology in the music classroom. Most striking about this volume is the degree to which digital technologies are presented less as a tool and more of a medium, which requires engagement and interaction. It is clear that many opportunities exist but the key to success is to consistently review whether they promote meaningful activity in your classroom.

The challenges of providing a flexible environment in which every student can engage in a meaningful way are great. However, the following section presents a suggestion of how it may be possible. A unit of work will be constructed from the key concepts, which brings together the illustration of meaning making in composing (Page 5) with the opportunities afforded by digital technologies (Page 15-16).
Table 1.1: Types of digital technologies that may support musical curricula

<table>
<thead>
<tr>
<th>Technology type</th>
<th>Technology group</th>
<th>Tool example</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile Systems</td>
<td>mp3(^1) players</td>
<td>IPOD, Creative Zen,</td>
<td>(Roberts 2005; Horn 2006; Ashworth 2007; Vardy and Kervin 2007)</td>
</tr>
<tr>
<td>Mobile Systems</td>
<td>Mobile phones</td>
<td>Iphone, Nokia, Motorolla, Samsung</td>
<td>(Roberts 2005; Ashworth 2007; Baxter 2007)</td>
</tr>
<tr>
<td>Web Based Services</td>
<td>E-portfolio’s, Blogs and wikis</td>
<td>NUMU, Teaching music, PBWiki, Wordpress</td>
<td>(Manning 2007; Ruthman 2007; Waters 2007; Ashworth 2008; Kirkman 2008; Savage 2008)</td>
</tr>
<tr>
<td>Web Based Services</td>
<td>e-learning platforms</td>
<td>Musit Interactive</td>
<td>(Lou, Dedic et al. 2003; Brickell and Herrington 2006; Seddon 2007; Rhode 2008)</td>
</tr>
<tr>
<td>Web Based Services</td>
<td>Networking platforms</td>
<td>Firstclass, Jam2Jam, Impromptu, ChucK, Audicle</td>
<td>(Dillon 2003; Cook, Davidson et al. 2005; Sorensen 2005; Brown and Dillon 2007; Dillon 2007; Kirkman 2007)</td>
</tr>
<tr>
<td>Computer-Based Tools</td>
<td>DJ software</td>
<td>E-Jay, Virtual DJ</td>
<td>(Dillon 2004; Gall and Breeze 2008; Green 2008)</td>
</tr>
<tr>
<td>Hardware User Interfaces</td>
<td>MIDI devices</td>
<td>Keyboards (MK149) Controllers (Korg nanoPAD), Mixers (BCF2000)</td>
<td>(Reese 2001; O’Neill and Seddon 2003; Gall and Breeze 2007; Kirkman 2007)</td>
</tr>
<tr>
<td>Hardware User Interfaces</td>
<td>Analogue-Digital audio devices</td>
<td>IO2, FA101, Audigy 2, MQT</td>
<td>(Reynolds 2003; Gall and Breeze 2005; Field 2007; Kirkman 2007)</td>
</tr>
<tr>
<td>Hardware User Interfaces</td>
<td>DJ systems</td>
<td>Turntable, Digital mixer</td>
<td>(Challis 2007)</td>
</tr>
<tr>
<td>Hardware User Interfaces</td>
<td>Extended use</td>
<td>Nintendo DS + Korg DS-10, Wii theramin</td>
<td>(Moore 2008)</td>
</tr>
</tbody>
</table>

\(^1\) Mp3 – Stands for ‘Media Player 3’ file. This is a standard digital format for storing musical sound performances.
2. PLANNING A UNIT OF WORK

With careful planning it is possible to construct an adaptable framework within which individual lessons provide students with the freedom they need to be creative, motivated and musical. Such a framework is structured to address the needs of the curriculum and flexible enough to meet each student’s needs. The aim of the unit is to demonstrate a working out of the key concepts into realistic classroom activities, which promote learning through the integration of digital technologies. Before turning to this we will look briefly at the process of planning followed in this case.

Curriculum planning can be thought of using the metaphor of archery from where we borrow much of the language. Your learner priorities are the main goals that you will ‘aim’ towards (think of them as an archery target that you line up to hit with your bow and arrow). Progress towards these priorities is demonstrated by achieved ‘outcomes’ or ‘objectives’ (you fire a shot…maybe you hit the outer circle of the target). Achievement of your priority is demonstrated by a fully achieved target (...you get a bullseye!).

Smart goals are specific short-term goals that clearly identify what will be done or what will be produced as work proceeds towards achieving your priorities. You will also ‘aim’ at these smart goals (think of them as small adjustments of your bow just before firing) and you know when you have done them (you point your arrow down a bit).

<table>
<thead>
<tr>
<th>SMART Goals:</th>
</tr>
</thead>
<tbody>
<tr>
<td>S - specific: clearly defined and understandable to all involved in the action</td>
</tr>
<tr>
<td>M - meaningful: They are relevant both to individuals and the group. They involve specific actions within a clear structure.</td>
</tr>
<tr>
<td>A - achievable action: It can be done within the limits of time, resources, knowledge, skill and understanding of participants</td>
</tr>
<tr>
<td>R - rewarding: work towards the goal will be satisfying and once completed, it will be recognised as an achievement</td>
</tr>
<tr>
<td>T - time-sensitive: enough time is available to achieve them (but not too much)</td>
</tr>
</tbody>
</table>

For further resources on smart goals see:  
http://www.projectsmart.co.uk and http://www.goal-setting-guide.com
2.1. UNIT CHECKLIST

Use the following list to translate the unit framework into your setting. Once you have answered the questions you can use the framework map to highlight the areas on which your students need to focus during this unit.

**Planning checklist**

**Starting off:**
1. What are your learners like now?
2. What are your priorities for this year?
3. What do you want your learners to achieve next?

**Surveying the land:**
4. What resources do you have available?
5. What is the timescale for this unit?

**Setting up:**
6. What skills and strategies do your learners need to develop?
7. What do your learners need to know?
8. What do your learners need to understand?

**Defining your targets:**
9. What will you focus on during this unit?
10. What will your learners be like when you have completed the unit?

**Lining up**
11. What instruction do you need to provide?
12. What learning activities do they need?

**Bringing it together:**
13. How will you organise the curriculum to achieve your priorities?

**Safety checks:**
14. What skills, knowledge or understanding do teachers and support staff need to deliver the unit?

**Take the shot**
15. Implement the curriculum using SMART goals

**Line up for a second shot**
16. Review progress toward your main priorities and make SMART adjustments as needed
2.2. A FLEXIBLE CURRICULUM FRAMEWORK:

The idea behind this unit is that the key concepts and **not** the content are at the forefront of the design. It should be noted that this is only one way of mapping out the concepts and skills into a unit map. The focus at each phase in the unit shifts between concepts, processes and skills. However, it has already been noted that these are not separate activities but depend upon each other. Thus, the emphasis may be on creativity while at the same time students are developing their critical understanding and team work skills as they engage in a performance focussed activity. The phases are for focus and clarity only. They are not mutually exclusive.

Figure 2.0 shows a unit framework for activities over 10 a week period. Each phase is a two week block. Each phase has a practice focus and lesson focus points that are drawn from the key concepts. Below this, figure 3.1 illustrates the way different technology types can be used to support activities that can focus on each of the different key concepts. Detail on each aspect of the technology map is provided in table 2.0. Links to relevant websites are provided in the resources section. You will notice that the key concepts are mapped through the practical activities of listening, composing, performing and collaborating. This is to reflect the nature of the musical curriculum digital technologies can support: key concepts 1.2 – 1.5 are embedded within practical musical activity.
Figure 2.0: A curriculum map showing key concepts, practice focus and PLTS
Figure 2.1: Digital Technologies Mapped to Key Concepts
<table>
<thead>
<tr>
<th>Link No.</th>
<th>Link</th>
<th>Opportunity for support</th>
<th>Resources/Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Listening-Mobile systems</td>
<td>Listening activities can be transferred to students’ mobile phones, mp3 players or pen drives for homework.</td>
<td>Requires computer for transfer</td>
</tr>
<tr>
<td>2</td>
<td>Listening-Computer-based tools</td>
<td>Computer based tools allow students to i) listen to their work, ii) can provide templates for modeling and iii) can be used to allow students to control how they listen during aural activities.</td>
<td>See resources section for suggestions</td>
</tr>
<tr>
<td>3</td>
<td>Composing-Computer-based tools</td>
<td>Computer-based tools allow students to see their unfolding composition in different screens, record multiple tracks print or save their work and work with synchronous video.</td>
<td>See the resources section for suggestions</td>
</tr>
<tr>
<td>4</td>
<td>Performing-Mobile systems</td>
<td>Many mobile phones include applications for sound synthesis. Some of these hold great potential as performance devices. See also applications for the Nintendo DS</td>
<td>See the resources section for suggestions</td>
</tr>
<tr>
<td>5</td>
<td>Performing-Hardware User Interfaces</td>
<td>As well as the most obvious keyboard interfaces digital pads, knobs, buttons and sliders offer many ways to interact with music in a hands on way. Many web forums offer support. Interactive whiteboards and computer-projectors can be used to assist class and group performances.</td>
<td>Korg Nanopad, Korg NanoKontrol, Various keyboard devices, Yamaha Tenori</td>
</tr>
<tr>
<td>6</td>
<td>Collaborating-Hardware User Interfaces</td>
<td>Some platforms allow users to collaborate live via hardware interfaces. This setting can be thought of as a live band or orchestra situation.</td>
<td>Examples include Jam2Jam and TamTam. See also mrmr for iphone.</td>
</tr>
<tr>
<td>7</td>
<td>Collaborating-Web Based Services</td>
<td>Collaboration via email, fileshare or messaging services provides a non real-time and more considered way to collaborate.</td>
<td>Examples include Firstclass, email, Windows Messenger. See also Jamstudio and Noteflight. Networking environments such as NUMU, Facebook, Ning or twitter can also be helpful. Web pages and Wikis can also be good source of information.</td>
</tr>
<tr>
<td>8</td>
<td>Mobile systems - Computer-based tools</td>
<td>Linking mobile systems to computer-based tools can provide ways of listening to and even adding to your developing work.</td>
<td>See built in phone applications &amp; resources section</td>
</tr>
<tr>
<td>Link No.</td>
<td>Link</td>
<td>Opportunity for support</td>
<td>Resources/Examples</td>
</tr>
<tr>
<td>---------</td>
<td>-------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>9</td>
<td>Computer-based tools - Hardware User Interfaces</td>
<td>Linking together computer-based tools and hardware user interfaces allows students to engage with the music as a more hands on activity. Different interfaces provide different modes of interaction so a variety of interfaces would be preferable.</td>
<td>Behringer B series, M-Audio trigger finger, Akai WHI-USB, Roland FC-300, TECH21 Foot controller, Numark Total Control DJ Controller.</td>
</tr>
<tr>
<td>10</td>
<td>Hardware User Interfaces - Web Based Services</td>
<td>Systems such as Jam2Jam and TamTam can utilize MIDI controllers to get a more hands on feel.</td>
<td>See MIDI controllers, collaboration online and and Networked live performance in the resources section</td>
</tr>
<tr>
<td>11</td>
<td>Computer-based tools - Web Based Services</td>
<td>i) Good templates and stimulus material can be downloaded from many web forums. ii) Uploading work in progress is a good way to encourage and generate feedback. iii) Publishing finished work on web forums as student e-portfolios can help to motivate provides resources for future projects and creates resources for other students. How about a weekly school podcast!</td>
<td>i) See resources section ii/iii) Networking sites such as NUMU, Ning and school website iv) See ‘podcasting resources’ in resources section</td>
</tr>
<tr>
<td>12</td>
<td>Mobile systems - Web Based Services</td>
<td>Linking mobile systems with web based services allows access to musical material for homework or out of music lessons (try playing through a phone your group’s recorded performance piece over the web via a podcast to accompany a drama!)</td>
<td>Twitter, Mobile Fotos and Facebook mobile are examples of applications that provide ways of sending information to and from phones. Try also Shoutcast and Youtube.</td>
</tr>
</tbody>
</table>
2.3. EMBEDDING TECHNOLOGIES IN THE CURRICULUM

Drawing on the planning map on page 14, the following unit is an example of how digital technologies can be used at different times in a unit of work. The content in the worked example is left intentionally broad to allow modification for the individual needs of different contexts and students. More detailed subject matter (eg theory, conventions, elements, etc.) will need to be considered if used in the classroom.

To make the best use of technologies it is worth remembering that:

1. Mobile systems are great because they are mobile – like a homework log or a ball point pen,
2. Web based systems are great because they link us together,
3. Computer-based tools are great because they offer lots of different ways to get into the music at a comparatively low cost, and
4. Hardware and user interfaces are great because they let us ‘get our hands dirty with the music’ at a comparatively low cost.

At the classroom end we should be working with tools fit for the task. If we want a hammer, of course we must think about what shape and size the handle needs to be to achieve comfort and grip, what weight it needs to achieve the desired force and what shape the head will need to be (claw, ball pein, cross pein, club, mallet). Is a hammer made of jelly ever going to be as good as one made of metal? If it is quicker and easier to write on paper, then use paper. If you forget your pen all the time and loose your homework log, then use your phone (or maybe you loose that too!). If you want lots of different ways to get into the music then why have a roomful of identical systems? If you can get into the music more easily by using a trumpet then use your trumpet. If you can’t play trumpet and keyboard at the same time then consider recording them separately. How about changing the sound using a microphone and guitar effects unit? Ask not ‘what can we do with it?’, but; ‘what does it allow us to do really well?’
2.3.1. Unit of work: a worked example

## Unit of work: ‘Freedom’

**Aims:** To explore notions of music, creativity and freedom in different contexts

<table>
<thead>
<tr>
<th>Week</th>
<th>Practice focus</th>
<th>Lesson focus points</th>
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<th>Technology opportunities</th>
<th>Key Process focus &amp; outcome</th>
<th>Assessment</th>
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</thead>
</table>
| 1-2  | Perform        | **Groundwork for critical understanding** | - The Spiritual (eg Deep river, Swing low)  
- Bob Marley: Song of freedom album  
- Film music: Amazing Grace (Newton’s Amazing Grace/Tchaikovsky’s “Morning Prayer) or Braveheart  
- The Music – “Freedom Fighters”  
- Soul music: Woman of the Ghetto - Marlena Shaw | 1, 2, 4 or 5: As a class use mobile system/s, hardware user interface/s or computer-based tool/s as accompaniment to a ‘freedom song’. | 2.1b, 2.2a Knowledge of how music is used to build community (eg collective singing/playing, lyrics, events) and express ideas | Formative assessment of performances |

<p>|       | <strong>Groundwork for cultural understanding</strong> | 6 or 7: use collaboration opportunities to work with students in another cultural context. | 2.1c, 3e Experience and share different approaches to using music for promoting human rights Knowledge of different conventions | Formative assessment of performances |</p>
<table>
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<tr>
<th>Week</th>
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<tbody>
<tr>
<td>3-4</td>
<td>Compose</td>
<td>Stimulus for creativity</td>
<td>Begin composing work related to ‘freedom’. i) film score ii) spiritual iii) fusion of different cultural styles (use experience from collaboration last week)</td>
<td>7 Use human trafficking stimulus from the web: video/mp3/website/picture. 3, 8, 4, 5-9 Store work using mobile systems or computer-based tools</td>
<td>2.1e, 3d Knowledge of relevant stylistic conventions (eg. Reggae rhythms, staff notation if appropriate, etc.)</td>
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<td></td>
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<td>Structuring for communication</td>
<td>Continue composing work. Focus on how the music is building community or expressing an idea (week 1)</td>
<td>2 Listen to previous work 3 record new ideas 5 collaborate on ideas</td>
<td>2.1d develop and extend ideas</td>
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<td>Combine with other art forms</td>
<td>Present composition as a performance event</td>
<td>5 perform as dramatic piece live using Hardware user interfaces 11, 12 upload from mobile system or computer-based tool to website and present as part of a web presentation/page</td>
<td>2.3e, 2.1b perform with control of instrument-specific techniques and musical expression</td>
<td>Summative assessment of cultural and critical understanding</td>
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<tr>
<td>5-6</td>
<td>Listen</td>
<td>Evaluate: cultural understanding</td>
<td>Use knowledge of different conventions to evaluate ‘success’ of performance</td>
<td>1 Using mobile devices to store work, evaluate individual work for homework</td>
<td>2.2c communicate ideas using expressive language and musical vocabulary 2.1g identify expressive use of elements, devices, tonalities and structures</td>
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<tr>
<td>Week</td>
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<tr>
<td>7-8</td>
<td>Collaborate</td>
<td>Independent inquiry</td>
<td>Collaborate by sharing individual performances and compositions to create group presentations on the topic of ‘freedom’.</td>
<td>As required: 1-12 Homework collaboration using mobile systems and web based services</td>
<td>2.2d adapt musical ideas, refine and improve their own work.</td>
<td>Formative reviews each lesson.</td>
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<td></td>
<td></td>
<td>Team work</td>
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<td>Self managers</td>
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<td>Effective participators</td>
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<td>Creativity: cross discipline work</td>
<td>Collaborate across subjects: Geography – Interdependence (political connections between places) Citizenship – Democracy &amp; Justice ICT – communication &amp; collaboration Modern foreign languages – linguistic competence &amp; creativity</td>
<td>5, 6, 7, 11, 12 - use using mobile systems and web based services to collaborate across time and space</td>
<td>2.2d adapt musical ideas, refine and improve their own work. 3f the use fo music technologies to create, manipulate and refine sounds</td>
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<tr>
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<td>9-10</td>
<td>Revise &amp; extend</td>
<td>Evaluate critical understanding</td>
<td>Compare music from weeks 1 and 2 with completed individual/group/cross discipline work. Discuss conventions, language, elements, devices, structures, different contexts and personal experiences of collaboration. Successes and points for improvement.</td>
<td>7 Review peers work on the web</td>
<td>Reviews demonstrating understanding of how music can help to build community</td>
<td>Summative assessment of reviews</td>
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<tr>
<td>Reflective learners</td>
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<td></td>
<td>7 Upload compositions to the web and create copyright free resource bank</td>
<td>3g property rights. 3e consideration of context</td>
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<tr>
<td>Creative thinkers</td>
<td></td>
<td>Construction of personal e-portfolio from ‘work during freedom’ unit. Personal extension projects: Personal web sites Continued collaboration with students from week 2 Involvement in charity work</td>
<td></td>
<td>1-12 as appropriate</td>
<td>3a performance activity within and beyond the classroom</td>
<td>Summative assessment of personal portfolio</td>
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</table>
2.4. TEMPLATES:

2.4.1. Curriculum map

<table>
<thead>
<tr>
<th>Phase</th>
<th>Stimulus</th>
<th>Ideas</th>
<th>Development</th>
<th>PLT</th>
<th>Transition</th>
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<tbody>
<tr>
<td>Practice Focus:</td>
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<tr>
<td>LESSON FOCUS POINTS</td>
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<tr>
<td>Timeline</td>
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Key:  
- **Key concepts**
- **PLT**
2.4.2. Sequence of learning

<table>
<thead>
<tr>
<th>Unit of work:</th>
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<tbody>
<tr>
<td><strong>Aims:</strong></td>
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<tr>
<td><strong>Week</strong></td>
<td><strong>Practice focus</strong></td>
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2.4.3. Lesson plan

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<tbody>
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<th>Lesson aim:</th>
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<td>Resources:</td>
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<thead>
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<th>Lesson content:</th>
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<tbody>
<tr>
<td>Understanding</td>
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<tr>
<td>Knowledge</td>
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<td>Processes/Skills</td>
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<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tr>
<th>Extension work</th>
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<tbody>
<tr>
<td>Homework</td>
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3. EXAMPLE RESOURCES:

3.1. MOBILE APPLICATIONS

IR-909 - [http://roventskij.net](http://roventskij.net)

3.2. NETWORKED LIVE PERFORMANCE

TamTam - [http://wiki.laptop.org/go/TamTam](http://wiki.laptop.org/go/TamTam)
Mrmr - [http://poly.share.dj/projects/#mrmr](http://poly.share.dj/projects/#mrmr)

3.3. COLLABORATION ONLINE

Jamstudio - [http://www.jamstudio.com/Studio/index.htm](http://www.jamstudio.com/Studio/index.htm)

3.4. SAMPLES/TEMPLATES

Goldbay - [http://www.goldbaby.co.nz/freestuff.html](http://www.goldbaby.co.nz/freestuff.html)
The classical MIDI connection - [http://www.classicalmidiconnection.com/](http://www.classicalmidiconnection.com/)

3.5. PODCASTING RESOURCES:

*Sound editing:*
Publishing:
Libcast - http://www.libcast.com/
Shoutcast - http://www.shoutcast.com/
Youtube - http://www.youtube.com/

Content management systems:
Wordpress - http://wordpress.com/
Drupal - http://drupal.org/
Jaws - http://www.jaws-project.com/
Comparison site - http://www.cmsmatrix.org/

3.6. ORGANISATIONS
http://atmionline.org/ - Association for technology in music instruction
http://www.isme.org - The International society for music education
http://www.menc.org/ - The National Association for Music Education (US)
http://www.midi.org/ - The MIDI Manufacturers Association (MMA)
http://musicalcreativity.com - The MENC Creativity Research Interest Group
http://www.name2.org.uk – National Association of Music Educators (UK)
http://www.ti-me.org/ - Technology Institute for Music Educators (TI:ME)
http://www.futurelab.org.uk – Futurelab

3.7. BLOGS AND COMMUNITIES:
http://www.teachingmusic.org.uk - Collaborative teacher blog
http://www.numu.org.uk/ - Community for young people
http://etobiasblog.musiced.net/
http://jsavage.org.uk/
http://weblog.siba.fi/msalavuo/
http://www.alexruthmann.com/blog/
http://www.kirki.co.uk

3.8. MAGAZINES:
http://metmagazine.com/ - Music education technology Magazine
http://www.futuremusic.co.uk/ - Futuremusic
http://www.soundonsound.com/ - Sound on Sound
http://mixonline.com/ - Mix Magazine
http://www.musictechmag.co.uk/ - Music Tech Magazine
http://www.wired.com/ - Wired
4. REFERENCES


OCR (2008). GCSE in Music, OCR.


Vardy, J. and L. Kervin (2007). Using iPod technology to engage primary students with the deconstruction and reconstruction of audio text. Literacy Learning: the Middle Years: 36.

