



Education and Culture DG

Lifelong Learning Programme

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Elaboration of the Module: Definition of the Programme

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1. Introduction

Many European nations recognise the need to revise curricula to meet the demands of today's workplace. At the same time, they must integrate growing immigrant population into their existing school systems and address the functional illiteracy of and “educated” population. Approximately 10 to 30 percent of the World's population have difficulty with basic reading, writing, and numeracy skills. This group, often referred to as “hard core” underachievers, fails basic skills testing in primary schools, falls behind, and may drop out in secondary school. [1]

In Europe, an excessively high number of young people drop out of school without basic skills and competencies that are fundamental for the knowledge society and to obtain a job. They face the risk of social exclusion; furthermore, they have been practically excluded from lifelong learning since birth.

Alternative innovative didactic methodology is needed to reduce premature school drop out, particularly of young people at risk of exclusion, such as migrants, ethnic groups and children/teenagers from difficult socio-economic background).

The key point is to modify the way to deliver learning. Cultural enrichment through young interest as such as music and art, use of technologies, social competencies, problem-solving skills in computer science, autonomy and sense of purpose may help childhood and adolescence to achieve an improved engagement in school and a sense of educational accomplishment. For instance:

- When a pupil learns, by experience, that music and technologies forge direct links between self and world, self expression becomes more fluent; the music helps interpret “who I am”. It is only a short jump from music creation using technologies to making the connection between self-discipline and performance in life [3].
- Music education also provides a critical introduction to the reinforcement of such academic and personal skills as critical thinking and learning how to work co-operatively toward shared goals.

- Children with a good interest in music, art easily accept the positive aspect of ethnic difference, to overcome their prejudices and biases and to mitigate conflicts and resolve them without violence [2]. It is the first step for reach integration. As we know integration is a good starting point in order to reach good self-discipline.
- Children with social competence show responsiveness to others, are able to adapt to new situations and circumstances, have the capacity for empathy and caring, have good communication skills, and have a good sense of humour. These children can get along well with adults as well as their peers.
- Children with problem-solving skills have the ability to attempt alternative solutions to problems they confront, whether cognitive or social.

Music Technology and music education foster a number of non-musical factors important for success in school and life. Three areas are important here:

1. Developmental goals such as self-esteem, self-discipline, and individual creativity;
2. The development of important academic and personal skills; and
3. The contribution of music to other areas of study.

Such skills are both implicit and explicit in music instruction. The inherent mathematical underpinning of music, for example, powerfully reinforce the analytical dimension of higher cognitive skills.

Abstract concepts such as counting, fractions, and ratios acquire concrete and tangible meaning when applied in a musical context, and the relationships between symbol and context are much more readily made. Music requires the integration of eye-hand co-ordination, rhythm, tonality, symbol recognition and interpretation, attention span, and other factors that represent synthetic aspects of human intelligence.

2. Chronological Pathway

In order to propose an alternative (but complementary) method to deliver learning, we decided to include in the E-motion curriculum the use of the latest technologies applied to music. It implies concepts referring to informatics, electronic and acoustics (or electro-acoustics).

This project focuses on the issue of early school leaving through an alternative educational module, which implies the Internet as a highly *appealing tool*. There is little doubt that students of this Century are particularly focused on use of technologies for “communication” and “sharing” of information through the Internet. In order to realise an effective educational project with potential to engage young students we ought to take advantage of the Internet; e.g., social networks. We strongly believe that communication skills and experiences sharing would certainly bring into educational activities a good level of competition and desire to do well.

E-motion curriculum is divided in five sections. These sections are chronologically ordered and can be developed by the school in different periods within the standard school curriculum. Following the instruction concerning the synchronisation between school subject and extra-school subjects will be compulsory for the project to succeed.

Each section has to be developed contemporarily within the school subject and the extra school teachers according to the hours of teaching of each subject.

As for the timeframe we tentatively propose the following (this needs to be discussed and agreed at the Rome meeting in November): the educational school programme would last for 4 months; for example, from late January 2010 to late May 2010. Every section would have a minimum duration of 20 hours for the school subjects and 40 for extra-school subjects.

Curriculum Characteristics

Two different paths concerning different historic points of view will be developed. The first one

will be developed within the school subjects and will concern general subjects about Geography and Socio-political contexts. The other one will be developed by musical examples by the extra-school teachers. It will concern the modern electroacoustic music composers and bands.

This curriculum is mostly general in order to give the opportunity for the ordinary school teachers to choose the right methodology for each class which would best suit the characteristics of each country.

In particular, the section “*learning by listening*” within the extra-school subjects has to be intended as a list of possible pieces of music that could be useful to be proposed to the students. Depending on the availability and needs the extra school teachers will choose the appropriate listening example.

Ongoing self-evaluation

The issue of evaluation of progress and measurement of results begs further discussion between the partners of the E-motion consortium. Our initial proposal is that for each section the University of Plymouth would provide a questionnaire to be compiled by the students involved, which would be aimed at supporting teachers to achieve the aims of this project. Also, it would be necessary to ensure that they are following the chronological pathway in synchrony with the extra-school teachers.

We also suggest the establishment of a *music contest* whereby each participant of E-motion would create (at least) one musical composition during the implementation of the programme. Once the project is completed, a selection of compositions would be recorded on a CD of the project (which could be released as a CD or made available on the Internet for downloading). These piece could be performed during the final end-of-project ceremony, which will take place in Plymouth.

Needless to say, it would be very important that each school make available a location where to implement such musical activities under the guidance of the teachers. Motivation, materials and suggestions are amply discussed in the following paragraphs.

	School subjects	Extra-school subjects
1st section	<p>Maths and Physics: How sounds move through materials, relationship between energy and waves.</p> <p>Geography (if applicable): study of general characteristics of Non-Western populations (India, Japan, Tibet)</p>	<p>Fractions and pitch, what is an intervals in music and pitch. Fractions and time signature.</p> <p>LEARNING BY LISTENING:</p> <ul style="list-style-type: none"> - Non-Western music. Japanese koto music. Indian raga music. Tibetan chants. - <i>Elements of modern history of electroacoustic music:</i> History of electromechanical instrument since Telharmonium developed by Thaddeus Cahill, Ondes Martenot used by Olivier Messiaen until actual modern electroacoustic instruments as synthesiser. <p>MUSIC CONTEST: explanation of what a composition can leads and goals</p>
2nd section	<p>Maths and Physics: Binary system.</p> <p>Geography (if applicable): study of general characteristics of Balkans story and population.</p>	<p>How do computers represent sound? Sampling. MIDI. Music acoustics: digital audio, synthesis, sampling, filters, hearing, psycho-acoustic.</p> <p>LEARNING BY LISTENING:</p> <ul style="list-style-type: none"> - Characteristic of Balkans music. - <i>Elements of modern history of electroacoustic music:</i> Futurists, 1911 (Luigi Russolo). Early electronic instruments, 1920–1930s (Etherophone, Hammond organ, Telharmonium). Musique

		<p>concrète (Pierre Schaeffer and Pierre Henry).</p> <p>MUSIC CONTEST: phase of ideas collection</p>
3rd section	<p>Maths and Physics: Waves, how sounds are produced through vibrations, pressure physics field, sound as longitudinal wave, frequency and period related to the sound wave. The speed of sound, sounds moving in different substance.</p> <p>Geography (if applicable): study of general characteristics of African story and population.</p> <p>History (if applicable): North African music, Arabic music, Mediterranean culture and music.</p>	<p>Intensity and the Decibel Scale, what is an inverse square relationship.</p> <p>Use tools for music creation: audio synthesis, sampling, audio editing and mixing.</p> <p>LEARNING BY LISTENING:</p> <ul style="list-style-type: none"> - Forms of folk and African tribal music. - Arabian peninsula music and influences in European music (i.e. Flamenco) - <i>Elements of modern history of electroacoustic music:</i> Stockhausen met Schaeffer, 1952. American electronic music, 1953 (John Cage, Earle Brown, Christian Wolff, David Tudor, and Morton Feldman). Stochastic music, 1952 (Iannis Xenakis). Buchla synthesiser, 1960. <p>MUSIC CONTEST: real start of the students work</p>
4th	Maths and Physics: Interference and	Natural Frequency.

<p>section</p>	<p>beats, phenomena of cancelling. (Use of optical principles).</p> <p>Geography (if applicable): study of general characteristics of Central South America story and population.</p>	<p>Algorithmic composition. Real-time interactive systems.</p> <p>Use knowledge of history and computer music composition techniques in music creation. Perform elementary analysis of computer music works.</p> <p>LEARNING BY LISTENING:</p> <ul style="list-style-type: none"> - Genres in Central South America. - <i>Elements of modern history of electroacoustic music:</i> Computer music. Live electronics. Use of synthesiser in rock music, 1970 (Pink Floyd, Tangerine Dream). Rise of popular electronic music, 1970 (Progressive rock, Berlin School of electronic music, space rock, examples as Genesis, The resident, David Bowie, Tangerine Dream). <p>MUSIC CONTEST: students work in progress and rehearsal if needs</p>
<p>5th section</p>	<p>Maths and Physics: Forced vibration, resonance phenomena</p> <p>Geography (if applicable): study of general characteristics of USA.</p> <p>History (if applicable): Protest</p>	<p>Standing wave patterns, harmonics. Sound synthesis techniques. Sound manipulation techniques. A "sampling" of major composers and compositions. Tools: audio editing, synthesis, sampling mixing, concert direction.</p> <p>LEARNING BY LISTENING:</p> <ul style="list-style-type: none"> - Moderns and popular music from USA. - <i>Elements of modern history of electroacoustic music:</i> Birth of MIDI 1980.

<p>music (blues, progressive, punk, rap, reggae, etc.).</p> <p>How <i>Race Music</i> explores the global influence and popularity of African American music, its social relevance, and key questions regarding its interpretation and criticism.</p>	<p>Rinse of dance music, late 1980s to 90s. Music software, circuit bending.</p> <p>MUSIC CONTEST: rehearsals if needs or last adjustments on the composition</p>
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3. School Topics: Motivations

In this section we provide a list of mathematics, physics, history and geography topics which are propaedeutic to the study of Music Technology. In this section we list those topics that would be developed within the school and in co-operation with the school teachers.

Mathematics and Physics

Musical set theory uses some of the concepts from mathematical set theory to organise musical objects and describe their relationships. Musical acoustics or music acoustics is the branch of acoustic concerned with researching and describing the physics of music, how sounds employed as music work.

- Sound and energy, how sounds move through materials, relationship between energy and waves.
- Fractions and pitch, what is an intervals in music and pitch.
- Fractions and time signature
- Waves, how sounds are produced through vibrations, pressure physics field, sound as longitudinal wave, frequency and period related to the sound wave
- Intensity and the Decibel Scale, what is a inverse square relationship.
- The speedy of sound, sounds moving in different substance.
- Interference and beats, phenomena of cancelling
- The Doppler Effect and Shock Waves
- Natural Frequency
- Forced vibration, resonance phenomena
- Standing wave patterns, harmonics
- Fundamental Frequency and Harmonics
- Binary system, sampling

Geography

Music is found in every known culture, past and present, varying wildly between times and places.

A culture's music is influenced by all other aspects of that culture, including social and economic organisation and experience, climate, and access to technology. The emotions and ideas that music expresses, the situations in which music is played and listened to, and the attitudes toward music players and composers all vary between regions and periods.

In musical terms, world music can be roughly defined as music that uses distinctive ethnic scales, modes and musical inflections, and which is usually (though not always) performed on or accompanied by distinctive traditional ethnic instruments, such as the kora (West African harp), the steel drum, the sitar or the didgeridoo.

- Non-Western music (including non-Western popular music and non-Western classical music)
- Japanese koto music
- Indian raga music
- Arabic music including several genres and styles
- Tibetan chants
- Balkans music
- Forms of folk and tribal music of the Middle East, Africa, Asia, Oceania and Central South America

History and Socio-political context

The 20th Century saw a revolution in music listening as the radio gained popularity worldwide and new media and technologies were developed to record, capture, reproduce and distribute music. Because music was no longer limited to concerts and clubs, it became possible for music artists to quickly gain fame nation wide and sometimes worldwide. Conversely, audiences were able to be exposed to a wider range of music than ever before. Music performances became increasingly visual with the broadcast and recording of music videos and concerts. Music of all kinds also became increasingly portable. Headphones allowed people sitting next to each other to listen to entirely different performances or share the same performance. 20th Century music brought a new freedom and wide experimentation with new musical styles and forms that challenged the accepted rules of music of earlier periods. The invention of musical amplification and electronic instruments, especially the synthesiser, in the mid-20th century revolutionised popular music and accelerated the development of new forms of music.

Socio-political point of view

1. Protest music (blues, progressive, punk, rap, reggae, etc.)
2. African American music, bebop to hip-hop, jazz, rhythm and blues, and gospel and the socio-political implications. How *Race Music* explores the global influence and popularity of African American music, its social relevance, and key questions regarding its interpretation and criticism

Urban and rural spaces in which music is experienced, produced and consumed

Underpinning all of the contributions is the recognition that musical processes take place within a particular space and place, where these processes are shaped both by specific musical practices and by the pressures and dynamics of political and economic circumstances. Important discourses are explored concerning national culture and identity, as well as how identity is constructed through the exchanges that occur between displaced peoples of the world's many diasporas. Music helps to articulate a shared sense of community among these dispersed people, carving out spaces of freedom which are integral to personal and group consciousness. A specific focal point is the *rap* and *hip hop* music that has contributed towards a particular sense of identity as indigenous resistance vernaculars for otherwise socially marginalised minorities in Cuba, France, Italy, New Zealand and South Africa.

4. Extra-Curricular Topics

The rationale for proposing extra-curricular subjects comes from the following considerations:

- 1) Need to distinguish the moment where students use technologies and the moment where students are in the class studying the curricular subjects will be important in order to make them concentrating differently on subjects that require different level of participation.
- 2) Having technologies and music experts will be very useful to focus students attention to the artistic side of the matter. This is very useful in order to catch their attention constantly.
- 3) Changing room or environment will help to create a new situation where the interaction between students has to be in a high level. They will collaborate on the same project so it is very important to create some sort of “musical/experimental laboratory” atmosphere.

What we suggest is to provide a tight collaboration between ordinary teachers and extra-curricular teachers. It will be necessary to forge liaison between the teachers to achieve the common aim.

These subjects are exclusive to the Music Technology domain. In this section, there are those topics that we suggest that should be inserted into learning topics, which are closest to Music Technology and which would be taught within the school by external teachers.

Music Technology

Music Technology is a term that refers to all forms of technology involved with the musical arts, particularly the use of electronic devices and computer software to facilitate playback, recording, composition, storage and performance. The concept of music technology is intimately connected to both musical and technological creativity.

- What is sound?
- How do computers represent sound?

- Sound synthesis techniques.
- Sound manipulation techniques.
- A "sampling" of major composers and compositions.
- MIDI.
- Algorithmic composition.
- Real-time interactive systems.
- Use tools for music creation: audio synthesis, sampling, audio editing, mixing, composition, concert direction.
- Use knowledge of history and computer music composition techniques in music creation, perform elementary analysis of computer music works.
- Music acoustic: digital audio, synthesis, sampling, filters, hearing, psycho-acoustics.

Historical points of view, contemporary and electroacoustic music

As music is a cultural phenomenon, the study of socio-cultural aspects of a given body of music assists in the greater understanding of the place of that music within a given culture at a given time. Electro-acoustic music, representing such an extreme departure in music history has influenced culture considerably.

- History of electromechanical instrument since Telharmonium developed by Thaddeus Cahill, Ondes Martenot used by Olivier Messiaen until actual modern electroacoustic instruments as synthesiser.
- Futurists, 1911 (Luigi Russolo).
- Early electronic instruments, 1920–1930s (Etherophone, Hammond organ, Telharmonium).
- Musique concrète (Pierre Schaeffer and Pierre Henry).
- Stockhausen met Schaeffer, 1952.
- American electronic music, 1953 (John Cage, Earle Brown, Christian Wolff, David Tudor, and Morton Feldman).
- Stochastic music, 1952 (Iannis Xenakis).
- Minimal music (Arvo Part)
- Buchla synthesiser, 1960. Computer music. Live electronics. Use of synthesiser in rock music, 1970 (Pink Floyd, Tangerine Dream).

5. Required Resources

Hardware

In order to be able to implement the programme presented above, we propose that each school needs to have one or more DAW (digital audio workstation) systems. The amount is to be defined according to the number of students involved; it is recommended that ideally no more than two students per DAW.

A digital audio workstation is an electronic system designed to record, edit and play back digital audio. A key feature of DAWs is the ability to freely manipulate recorded sounds. Many DAWs, especially computer-based DAWs, have MIDI recording, editing, and playback capabilities. We need to use a computer-based DAWs because the students will use computer also to upload their work to the Internet (this will be discussed later).



Fig.1: Example of computer-based DAW system

A computer based DAW consist of three components: (a) computer (PC or Mac/Intel) with any Operational System (Windows, MacOSX, Linux), (b) audio interface (any) and (c) a digital audio editor software.

The computer acts as a host for the sound card and software and provides processing power for audio editing. The sound card/audio interface typically convert analogue audio signals into digital form and may also assist in processing audio and for playback converting digital to analogue audio.

The software controls the two hardware components and provides a user interface to allow for recording, editing, and playback.

In order to use the MIDI protocol as input for the system is required a MIDI keyboard (any). It will also be necessary also to have two speakers (any) and a video camera.

Summarising, each school has to provide a number of the follow hardware setup:

1. Computer (PC or Mac/Intel) with any Operative System (Windows, MacOSX, Linux)
2. Audio interface (any)
3. A digital audio editor software
4. A midi keyboard (any).
5. Two speakers
6. Video Camera

In the following paragraph we discuss the point (c) of our list of resources: that is, software. The choose of the software is quite important in order to make the system working in the right way for our purposes.

The school will be free to use their own computer/computers adapting the rest of the equipment to their computer. For example, if they have a PC with Microsoft Windows OS (Operational System) running they will choose any audio interface compatible with Microsoft Windows OS and a software compatible with the Operative System. In the next section is possible to find compatibility

and free or commercial software that can be chosen by each school.

Software

There are two different typologies of software concerning audio and music composing: “MIDI editors and sequencers” and “Recording and editing”.

MIDI (Musical Instrument Digital Interface)

MIDI is a standard protocol that enables electronic musical instruments such as a keyboard controllers, computers, and other equipment to communicate, control and synchronise with each other. MIDI allows computers, sound cards, MIDI keyboards to control one another and to exchange system data. MIDI does not transmit an audio signal but events messages such as the pitch and intensity of musical notes to play, control signals for parameters such as volume and clock signals to set the tempo.

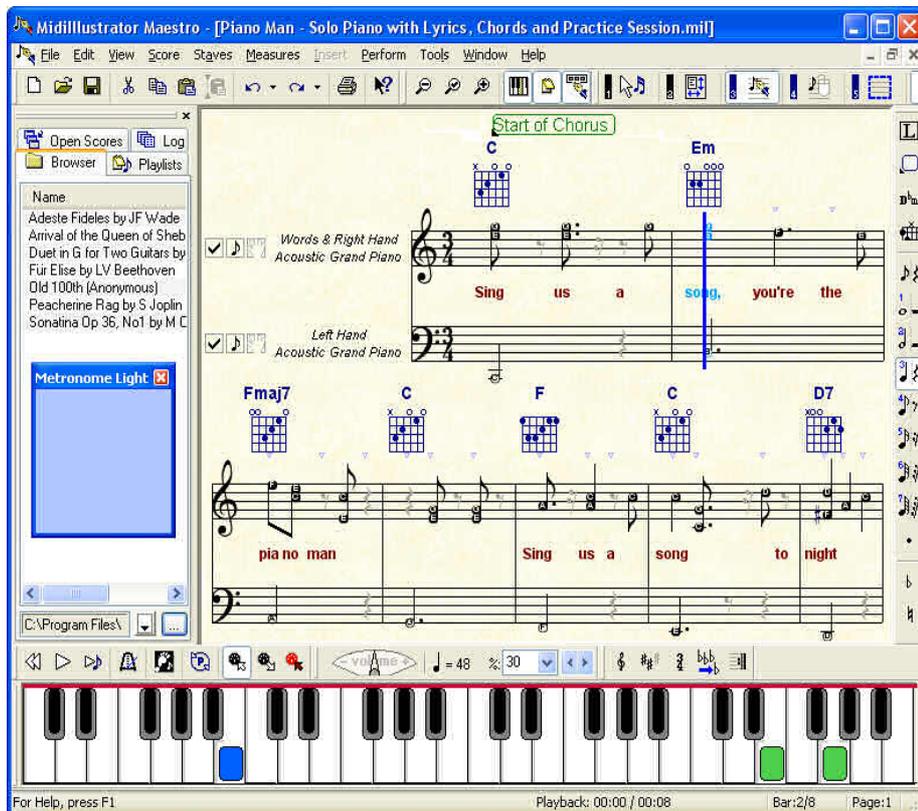


Fig.2: Snapshot of a typical MIDI editor and sequencer.

MIDI editors and sequencers are useful for several reasons. MIDI composition and arrangement takes advantage of the General MIDI technology to allow musical data files to be shared among various electronic instruments by using a standard, portable set of commands and parameters. Because the music often is simply data rather than recorded audio waveforms, the data size of the files is quite small by comparison with audio data. Several computer programs allow manipulation of the musical data such that composing for an entire orchestra of synthesised instrument sounds is possible. The data can be saved, modified and reproduced by any computer or electronic instrument that adheres to the same MIDI standards. Fig. 2 shows a snapshot of a typical MIDI editor and sequencer.

Audio Files

An **audio file format** is a file format for storing audio data on a computer system. The general approach towards storing digital audio is to sample the audio voltage in regular intervals (forming the sample rate). A sample way to create an audio file is to record a sound through the hardware we amply present in the previous section and save it.



Fig. 3: Pro-tools software (proprietary) snapshot.

Therefore audio files can be recorded, modified (edited) in the same way as any other text document.

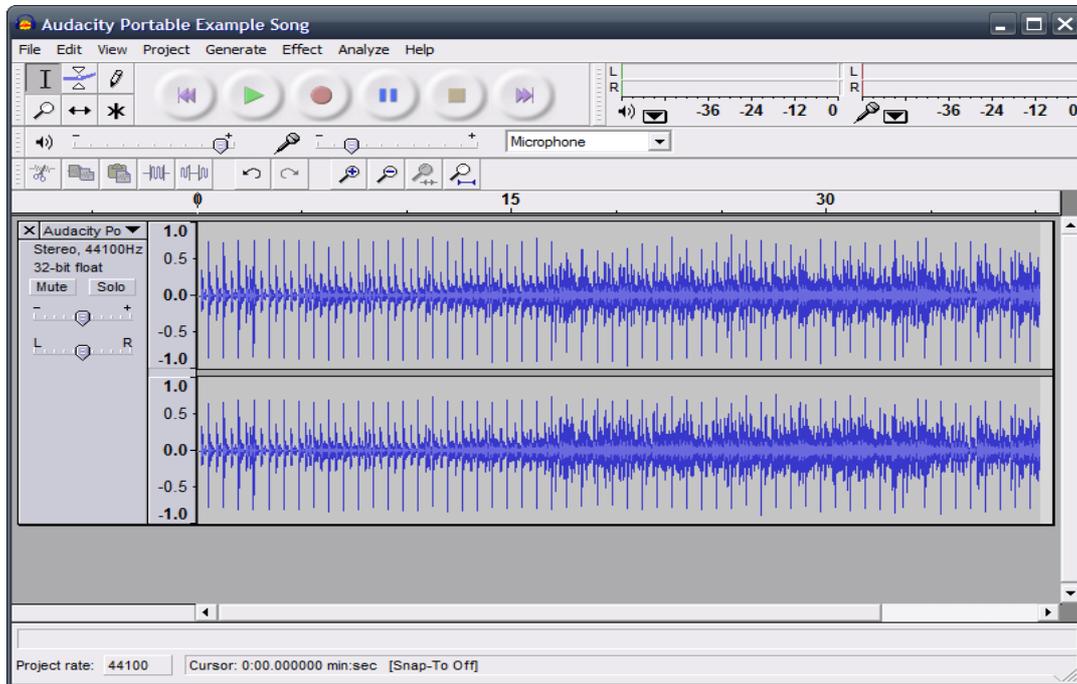


Fig. 4: Audacity (free software) snapshot.

It is possible to cut and paste, move portions of audio and convert audio into other format (such as MP3). All this can be done using a recording/editing software. Fig. 3 and Fig.4 show how an audio editor and recorder may look like. Here we present a list of software (proprietary¹, free software², GPL³, Open Source⁴) that can be used during the extra school time. Within the list we highlighted in

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- 1 **Proprietary software** is any computer software with restrictions on use or private modification, or with restrictions judged to be excessive on copying or publishing of modified or unmodified versions. The term *proprietary software* is thus the opposite of free software, generally speaking. "Proprietary software" is not synonymous with "commercial software", it can be distributed at no cost or for a fee, and free software can be distributed at no cost or for a fee. The difference is that whether or not proprietary software can be distributed, and what the fee would be, is at the proprietor's discretion. With free software, anyone who has a copy can decide whether, and how much, to charge for a copy or related services
 - 2 **Free software**, is software that can be used, studied, and modified without restriction, and which can be copied and redistributed in modified or unmodified form either without restriction, or with minimal restrictions only to ensure that further recipients can also do these things and that manufacturers of consumer-facing hardware allow user modifications to their hardware. Free software is available gratis (free of charge) in most cases.
 - 3 The **GNU General Public License (GNU GPL or simply GPL)** is a widely used free software license.
 - 4 **Open source** is an approach to the design, development, and distribution of software, offering practical accessibility to a software's source code.

particular Free software and GPL. Free software (and in most of cases also open sources and GPL software) can be downloaded for free through websites. We strongly believe in free software because it would encourage students to download it and install on their own computers at home (or owned by members of their family) and this would mean that they would take home at they have learned at school.

Using the follow two tables each school can start analysing the hardware they already have in their school. For example. if they have a Microsoft Windows platform they can choose (both within proprietary or free software or GPL) the software they prefer (for both typologies, MIDI editor and sequencer and AUDIO recording and editing). It will be the external teacher in particular who has to evaluate which software is appropriate for his/her lessons according to the institution and the coordinator of the project.

List of MIDI editors and sequencers			
Software	Platform	License	Notes
Anvil Studio	Microsoft Windows	Proprietary	Multi-track recording, composing, and editing of audio and MIDI music files
Adobe Audition	Microsoft Windows	Proprietary	Recording, mixing, editing, and mastering
Band-in-a-Box	Mac OS, Microsoft Windows	Proprietary	Music composition tool for exploring and developing musical ideas with near-instantaneous feedback
Cakewalk	Microsoft Windows	Proprietary	Home music production
Craterfish Midi Editor	Internet explorer, Mozilla Firefox	Proprietary	A free online midi editor
Cubase	Windows, Mac OS, Linux	Proprietary	Recording, mixing, editing, and mastering.
Digital Performer	Mac OS	Proprietary	Full-featured Digital Audio Workstation/Sequencer software package
DirectMusic Producer	Windows	Free-ware	Complete system for implementing dynamic soundtracks
Finale	Windows, Mac OS	Proprietary (Freeway version exists)	Composition and sequencing program.
Free-ware	Mac OS, Linux	GPL	Integrates 3D graphics with MIDI devices
GarageBand	Mac OS	Proprietary	Import only, saves to native format
GNMIDI	Windows	Shareware	MIDI file converter, karaoke editor
Guitar Pro	Windows, Mac OS	Proprietary	Multitrack tablature editor for guitar, banjo and bass
GNU LilyPond	Windows, Linux, Mac	GPL	Export only

	OS (Lava Based)		
JAZZ++	Windows, Mac OS, Linux	Open Source	MIDI sequencer with track window, piano roll window, audio signal processing
JFugue	Windows, Mac OS, Linux (Java-based)	LGPL, open source	Programming library (API)
KeyKit	Windows, Linux	Free	Graphical user interface for MIDI, useful for both algorithmic and realtime musical experimentation
Live	Windows, Mac OS	Proprietary	Audio/MIDI recording, mixing, editing, and mastering.
Logic	Mac OS (also previously for Windows)	Proprietary	Audio/MIDI recording, mixing, editing, and mastering.
Master-Tracks Pro	Windows, Mac OS	Proprietary	File formats: proprietary (.mts), also .mid 0 & 1 ex- import
Melody Assistant	Windows, Mac OS	Shareware	Music writing, printing and rendering
MidiCond	Windows, Mac OS, Linux	Proprietary	Tempo manipulation for live conducting and recording
MidiSwing	Windows, Mac OS, Linux	Freeway	MIDI sequencer. MIDI recording, editing, and playback. Support for .kar karaoke files.
Mixcraft	Windows	Proprietary	Audio and MIDI sequencer. Support for VSTis, MIDI recording, editing, and playback.
Mozart	Windows	Proprietary	Music notation software
MusE	Linux	GPL	Music software to , convert, rip and create audio files effortlessly
MuseScore	Windows, Mac OS, Linux	GPL	Music notation software with full MusicXML support
MusicPhrase	Windows	Gladius	MIDI sequence editor
Notation Composer	Windows	Proprietary	MIDI recording, editing and playback, with notation transcription of MIDI data for score writing
NoteEdit	Linux	GPL	Music score editor
NoteWorthy Composer	Windows	Proprietary	Can import and export MIDI data, but only edit and display it as a musical score.
PianoCheater	Windows	Freeway	Midi sequencer built for a keyboard player
Pro Tools	Windows, Mac OS	Proprietary	Audio/MIDI recording, mixing, editing, and mastering.
Quartz AudioMaster	Windows	Freeway	Fully functional MIDI player
REAPER	Windows	Proprietary	MIDI recording, editing and playback,
Reason	Windows, Mac OS	Proprietary	Studio rack where is possible to insert virtual devices such as instruments, effects processors and mixers.
Renoise	Windows, Mac OS	Shareware	Digital audio workstation
Rosegarden	Linux	GPL	Audio and MIDI sequencer, score editor, general-purpose music composition and

			editing environment
Seq24	Linux, Windows	GPL	MIDI music sequencer
Samplitude	Windows	Proprietary	Professional HD Recording and Editing
Sibelius	Windows, Mac OS	Proprietary	Music notation
Sonar	Windows	Proprietary	Recording, composing, editing, mixing, and mastering
TuxGuitar	Windows, Mac OS, Linux, (Java-based)	GPL, open source	Multitrack guitar tablature editor and player
TiMidity++	Linux	GPL	Software synthesizer

As we told before the follow is a list of recording and editing software with compatibility. This will help the schools to find how to use the hardware materials they already have in their own school.

Recording and editing (collection of free software with compatibility)					
In the case of schools that have computers with different platforms and/or Operative System, they will be able to install the same software on different machines.					
Name	Linux	Mac OS X	Unix	Windows	Notes
Ardour	Yes	Yes	Yes	No	Multi-track audio recorder
Audacity	Yes	Yes	Yes	Yes	Recording, composing, editing, mixing.
Audiobook Cutter	No	No	No	Yes	MP3 audiobook splitter
Ecasound	Yes	Yes		No	Audio recorder
Freecycle	Yes	No		No	Beat slicer
Jokosher	Yes	No		No	Multi-track audio editor
LMMS	Yes	Yes		Yes	Intended as a replacement for Cubase-like software (DAW)
Mp3splt	Yes	Yes		Yes	Splits MP3 and Vorbis files without decoding (see mp3splt-gtk and libmp3splt)
MusE	Yes	No		No	MIDI sequencer
Qtractor	Yes	No		No	A non-destructive multi-track audio and MIDI Workstation (DAW)
ReZound	Yes	No	No	No	Graphical audio file editor
RiffWorks T4	No	Yes	No	Yes	Multi-track audio recorder
Rosegarden	Yes	No		No	MIDI sequencer and multi-track recorder
SoX	Yes	Yes	Yes	Yes	Command-line multi-track audio editor/processor
Sweep	Yes	No	Yes	No	Digital audio editor
Wave Editor	No	No	No	Yes	Digital Audio editor
WaveSurfer	Yes	Yes	Yes	Yes	Audio editor widely used for studies of acoustic phonetics
Wavosaur	No	No	No	Yes	Audio editor with VST effects support

6. Examples of Didactic Material: Online Google Books

These resources must be intended in particular as didactic suggestions for the teachers. For standard teachers most of these book may not be interesting or may even be difficult to understand because they might be too technical or specialised. Nevertheless, they may prove to be useful to foster close relationships between the standard teachers and the extra-curricula teachers.

We suggest to make them available through the E-motion website and would therefore be available for those interested students who may want to go into more depth to satisfy particular curiosities that may emerge during the lessons.

We selected English books both for Romanian and English teachers in order to cover the gap of not having suitable Googol books available in Romanian language. Of course, other books or literature suggestion by the teachers will be considered is they address the remits of this project.

We suggest that we give priority for using books available on “Google books”, a sort of virtual library that can be consulted by Internet. It will make simple for teachers and students to reach information for free. It means also that students can have a look to these book from their own home, without the need to buy them or having to borrow them from libraries.

For UK and Romanian teachers

Music of the twentieth century: a study of its elements and structure

By Ton de Leeuw, Rokus de Groot

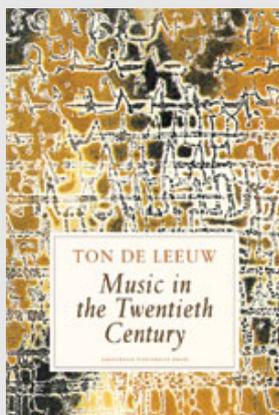
Contributor Rokus de Groot

Edition: illustrated

Published by Amsterdam University Press, 2006

ISBN 9053567658, 9789053567654

223 pages



Ton de Leeuw was a truly groundbreaking composer. As evidenced by his pioneering study of compositional methods that melded Eastern traditional music with Western musical theory, he had a profound understanding of the complex and often divisive history of twentieth-century music. Now his renowned chronicle *Music of the Twentieth Century* is offered here in a newly revised English-language edition.

Music of the Twentieth Century goes beyond a historical survey with its lucid and impassioned discussion of the elements, structures, compositional principles, and terminologies of twentieth-century music. De Leeuw draws on his experience as a composer, teacher, and music scholar of non-European music traditions, including Indian, Indonesian, and Japanese music, to examine how musical innovations that developed during the twentieth century transformed musical theory, composition, and scholarly thought around the globe.

Race music: black cultures from bebop to hip-hop

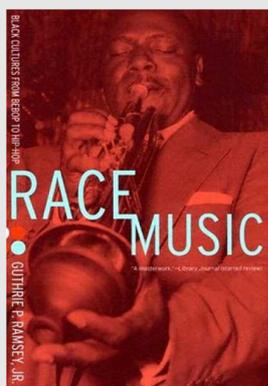
By Guthrie P. Ramsey

Edition: illustrated

Published by University of California Press, 2003

ISBN 0520210484, 9780520210486

281 pages



This powerful book covers the vast and various terrain of African American music, from bebop to hip-hop. Guthrie P. Ramsey, Jr., begins with an absorbing account of his own musical experiences with family and friends on the South Side of Chicago, evoking Sunday-morning worship services, family gatherings with food and dancing, and jam sessions at local nightclubs. This lays the foundation for a brilliant discussion of how musical meaning emerges in the private and communal realms of lived experience and how African American music has shaped and reflected identities in the black community. Deeply informed by Ramsey's experience as an accomplished musician, a sophisticated cultural theorist, and an enthusiast brought up in the community he discusses, *Race Music* explores the global influence and popularity of African American music, its social relevance, and key questions regarding its interpretation and criticism.

Music, space and place: popular music and cultural identity

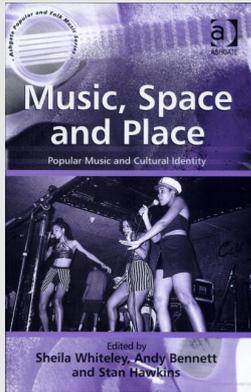
By Sheila Whiteley, Andy Bennett, Stan Hawkins

Edition: illustrated

Published by Ashgate Publishing, Ltd., 2005

ISBN 0754655741, 9780754655749

238 pages



Music, Space and Place examines the urban and rural spaces in which music is experienced, produced and consumed. The editors of this collection have brought together new and exciting perspectives by international researchers and scholars working in the field of popular music studies. Underpinning all of the contributions is the recognition that musical processes take place within a particular space and place, where these processes are shaped both by specific musical practices and by the pressures and dynamics of political and economic circumstances. Important discourses are explored concerning national culture and identity, as well as how identity is constructed through the exchanges that occur between displaced peoples of the world's many diasporas. Music helps to articulate a shared sense of community among these dispersed people, carving out spaces of freedom which are integral to personal and group consciousness.

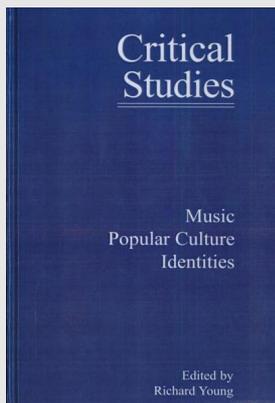
Music popular culture identities

By Richard Young

Published by Rodopi, 2002

ISBN 9042012498, 9789042012493

360 pages



Music, Popular Culture, Identities is a collection of sixteen essays that will appeal to a wide range of readers with interests in popular culture and music, cultural studies, and ethnomusicology. Organised around the central theme of music as an expression of local, ethnic, social and other identities, the essays touch upon popular traditions and contemporary forms from several different regions of the world: political engagement in Italian popular music; flamenco in Spain; the challenge of traditional music in Bulgaria; boeren rock and rap in Holland; Israeli extreme heavy metal; jazz and pop in South Africa, and musical hybridity and politics in Côte d'Ivoire. The collection includes essays about Latin America: on the Mexican corrido, the Caribbean, popular dance music in Cuba, and bossanova from Brazil. Communities of a cultural diaspora in North America are discussed in essays on Somali immigrant and refugee youth and Iranians in exile in the US.

Music, national identity and the politics of location: between the global and the local

By Ian D. Biddle, Vanessa Knights

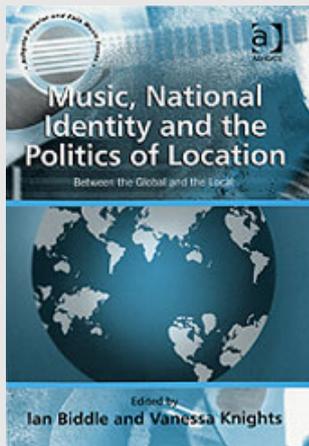
Contributor Ian D. Biddle

Edition: illustrated

Published by Ashgate Publishing, Ltd., 2007

ISBN 0754640558, 9780754640554

251 pages



How are national identities constructed and articulated through music? Popular music has long been associated with political dissent, and the nation state has consistently demonstrated a determination to seek out and procure for itself a stake in the management of 'its' popular musics. Similarly, popular musics have been used 'from the ground up' as sites for both populist and popular critiques of nationalist sentiment, from the position of both a globalising and a 'local' vernacular culture. The contributions in this book arrive at a critical moment in the development of the study of national cultures and musicology. The book ranges from considerations of the ideological focus of cultural nationalism through to analyses of musical hybridity and musical articulations of other kinds of identities at odds with national identity. The processes of global homogenisation are thereby shown to have brought about a transitional crisis for national cultural identities: the evolution of these identities, particularly with reference to the concept of 'authenticity' in music, is situated within broader debates on power, political economy and constructions of the self.

Music and society: the politics of composition, performance, and reception

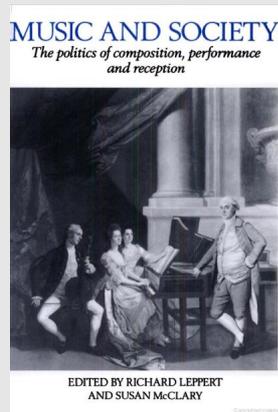
By Richard Leppert, Susan McClary

Edition: illustrated

Published by Cambridge University Press, 1989

ISBN 0521379776, 9780521379779

224 pages



This provocative volume of essays is now available in paperback. The contributors to this volume - musicologists, sociologists, cultural theorists - all challenge the view that music occupies an autonomous aesthetic sphere. Recently, socially and politically grounded enterprises such as feminism, semiotics and deconstruction have effected a major transformation in the ways in which the arts and humanities are studied, leading in turn to a systematic investigation of the implicit assumptions underlying the critical methods of the last two hundred years. Influenced by these approaches, the writers here question a prevailing ideology that insists there is a division between music and society and examine the ways in which the two do in fact interact and mediate one another within and across socio-cultural boundaries.

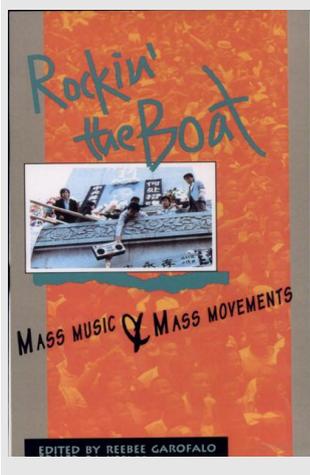
Rockin' the boat: mass music and mass movements

By Reebee Garofalo

Published by South End Press, 1992

ISBN 0896084272, 9780896084278

333 pages



"Popular music, for all its contradictions, lets us feel the pulses of grassroots social awareness...Rockin' provides excellent, detailed documentation of a wide variety of social stirrings. It's a source of hope."

For Italian teachers

Sound tracks: tracce, convergenze e scenari negli studi musicali

Curatore: Francesco D'Amato

Meltemi Editore srl, 2001

191 pages



La musica è uno dei linguaggi più pervasivi del nostro tempo. Eppure fatica a ritagliarsi degli spazi nei luoghi deputati all'analisi della società e della comunicazione. Qual è il rapporto tra musica e cultura? Che contributo possono portare le riflessioni sul genere? Come ripensare, quindi, oggi l'idea di musica? Quale il ruolo delle nuove tecnologie? A questi e ad altri interrogativi rispondono i saggi raccolti nel volume, il cui intento è quello di dare visibilità a un dialogo, troppo spesso relegato ai margini dell'istituzione accademica, fra studiosi di musica provenienti da diversi ambiti disciplinari. La musica è un oggetto multidimensionale e può essere analizzato in modo significativo da diverse prospettive. Questo libro rappresenta proprio un'occasione di incontro tra competenze, interessi e ricerche differenti. I saggi raccolti, oltre a riunire specialisti – Simon Frith, Francesco D'Amato, John Shepherd, Franco Fabbri, Roberto Agostini, George Lipsitz, Steve Jones, Anahid Kassabian – da lungo tempo attivi nell'approfondimento dei temi sviluppati, si muovono lungo alcune delle coordinate che nell'ultimo ventennio hanno maggiormente contribuito al rinnovamento dello studio della musica.

Il suono riprodotto: storia, tecnica e cultura di una rivoluzione del Novecento

Alessandro Rigolli, Paolo Russo

EDT srl, 2007

ISBN 8860401763, 9788860401762

167 pages



Alla fine dell'Ottocento si verifica un evento che in pochi decenni rivoluziona il modo di intendere, creare e ascoltare la musica: la messa a punto di una tecnica per la riproduzione del suono. Da allora la storia dei mezzi di diffusione e di riproduzione sonora è parte della storia e della cultura musicale moderna. Con il fonografo a cilindri, brevettato da Edison nel 1877, e il grammofono di Berliner, comparso dieci anni dopo, l'ascolto musicale si trasforma, stimolato anche dalla neonata industria discografica e radiofonica che tramuta in musica di massa generi come il jazz, e in veri e propri personaggi mediatici artisti come Enrico Caruso o Arturo Toscanini. Radio e dischi, inoltre, sono stati i principali protagonisti della creazione di nuovi generi quali il rock o il pop. I mezzi di riproduzione e diffusione sonora rappresentano oggi uno dei principali canali di consumo musicale.

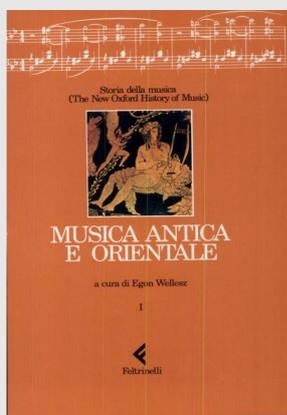
In un articolato confronto tenuto alla Casa della Musica di Parma in occasione del convegno Ladimus del 2006, gli interventi di musicologi, tecnici, artisti e discografici hanno spaziato dalla storia e dalla cultura della musica riprodotta alla qualità del suono registrato come "oggetto" culturale da conservare, dagli aspetti tecnico-creativi della registrazione a quelli sociologici, fino all'esame dell'incisione del suono come interpretazione musicale di un testo. Qui raccolti, tali interventi costituiscono un rilevante contributo al sempre più ampio dibattito sulle molte sfaccettature che caratterizzano il panorama odierno della registrazione e riproduzione musicale.

Storia della musica. The New Oxford History of Music, Volume 1

by Egon Wellesz, Giampiero Tintori

Feltrinelli Editore, 1987

588 pages



Fino a pochi decenni or sono per "storia della musica" si intendeva semplicemente la "storia dell'arte musicale in Europa". Poi, soltanto gradualmente, lo studio della musica si è esteso a indispensabili ricerche sulla musica extraeuropea e infine sulla musica primitiva. E poiché le testimonianze di musica primitiva rimaste nella musica popolare europea sono assai scarse, per avere qualche idea dell'attività musicale dei primitivi gli studiosi dovettero rivolgere le loro ricerche alle tribù che ancora vivono l'età della pietra. Contemporaneamente lo studio da tempo incominciato delle civiltà extraeuropee maggiormente sviluppate ebbe nuovo impulso e diede vita a un nuovo ramo della musicologia dedicato esclusivamente alla musica extraeuropea.

Sociologia della musica urbana: artisti di strada a Roma

by Federico Del Sordo

Meltemi Editore srl, 2005

262 pages



Accanto alla produzione musicale “istituzionale” ne esiste un’altra, che si muove “sotterraneamente” negli spazi urbani creando relazioni e interagendo nelle nostre vie quotidiane. È quella dei buskers, suonatori di strada, di piazza o di metropolitana, insomma di “non-luoghi”: alcuni italiani, molti provenienti dai flussi costanti dell’immigrazione, specialmente quella dall’est dell’Europa. A Milano è nata un’associazione per tutelare questi musicisti e per promuovere e diffondere eventi musicali legati all’arte di strada. Perché in Italia soprusi e maltrattamenti sono all’ordine del giorno, mentre in tanti paesi europei le autorità concedono ai buskers perfino vere e proprie licenze che consentono loro di esibirsi in tutta tranquillità. I pregiudizi sulla musica di strada si incontrano allora con la sociologia della devianza, perché la musica-dello-straniero non appare compatibile con la retorica del sistema. Per questo la musica sui vagoni della metro diventa per l’autore una sorta di osservatorio dell’esistere “turbato”. Questo testo offre una delle tante possibili letture di un fatto musicale attuale, delineando i contorni di una sociologia della musica attraverso la lente della disgregazione identitaria che il corpo subisce, soprattutto a causa della sua crescente mediatizzazione.

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Alessandro Rigolli, Paolo Russo

EDT srl, 2007

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167 pages



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Mappa delle voci: rap, raggamuffin e tradizione in Italia

by Goffredo Plastino

Meltemi Editore srl, 1996

141 pages



La voce umana si diffonde dai ghetti urbani per esprimere pulsioni, speranze, solitudini. Tracce sonore scandiscono il ritmo dei labirinti metropolitani e, attraverso la tecnologia, si intrecciano con i rumori della strada in uno slang musicale che si fa lingua della marginalità. Il rap e il raggamuffin esaltano la voce e trasformano con esplosive improvvisazioni verbali la vita quotidiana in un immediato racconto. La loro crescente affermazione in Italia intercetta e amplifica i bisogni delle culture giovanili. Nuove identità si sovrappongono ad antiche memorie. I dialetti rivivono e si trasformano nell'incontro insolito e fecondo con il linguaggio musicale della contemporaneità. E frammenti delle musiche tradizionali vengono mescolati ai suoni digitali in una sintesi postmoderna.

Interpretare la differenza

Volume 36 of Critica e letteratura

Laura Di Michele, Luigi Gaffuri, Michela Nacci

Liguori Editore Srl, 2002

ISBN 8820733094



Multiculturalismo e identità, immigrazione ed esclusione, alterità e altrove, razzismo e xenofobia, sincretismi e fondamentalismi religiosi, narrazioni e nomadismi culturali sono i temi affrontati da questo libro che considera la differenza come luogo multiplo, come foucaultiana formazione discorsiva discontinua e in movimento. Argomenti che evocano sia i livelli di condivisione e conflitto presenti nelle odierne società multietniche, sia le contaminazioni e gli intrecci tra globale e locale caratterizzanti i confini mobili e gli orizzonti incerti del mondo contemporaneo. Ma sono anche aspetti consueti della vita quotidiana, ormai a tal punto parte del nostro vocabolario culturale e politico che spesso ci è difficile penetrare nella giungla di segni e simboli in cui siamo costantemente avvolti, anche a nostra insaputa. In questa straordinaria giungla, minacciosa e allo stesso tempo vitale, sono senza tregua messe alla prova, attaccate e decostruite e infine risignificate, ma di nuovo sottoposte a discussione, quelle che appaiono come diversità rispetto a identità acquisite nell'esperienza del pensiero occidentale, come differenze tutte da esplorare non per appropriarsene bensì per conoscere noi stessi e gli altri.

Educazione musicale e nuove tecnologie

Amedeo Gaggiolo

EDT srl, 2003

ISBN 8870636704, 9788870636703

156 pages



Il forte impulso ministeriale alla diffusione dell'informatica nella scuola ha fatto sì che il computer sia entrato ormai, a tutti gli effetti, nella realtà scolastica, diventando, grazie anche all'impegno e alla disponibilità di un buon numero di insegnanti, un punto di riferimento per tutte le discipline. Ma alla rapida diffusione delle risorse tecnologiche non corrispondono modalità di utilizzo didattico efficaci e pertinenti, tantomeno a supporto dell'educazione musicale. Questo libro si rivolge agli insegnanti di musica di tutte le scuole e, utilizzando un linguaggio privo di tecnicismi, si propone di:

- favorire l'aggiornamento, attraverso l'osservazione delle peculiarità intrinseche al computer e l'esame delle nuove strategie che possono svilupparsi dal rapporto fra didattica della musica e informatica;
- evidenziare i nuovi scenari espressivi e comunicativi che scaturiscono dalla multimedia e dall'impiego di Internet in ambito educativo;
- offrire concrete attività di impiego del computer nell'educazione musicale, attraverso una serie di unità didattiche che l'insegnante può utilizzare direttamente in classe.

7. Complementary Methodology using the Internet

As anticipated earlier, we suggest the use of the Internet as an *appealing tool* to promote engagement of the young generation. As children of the information age, youths are often regarded and portrayed as technological experts in particular concerning all the communication skills they can achieve using the Internet as tool for gathering and sharing information. Also, being able to master the Internet is an imperative for anyone intending to enter the job market, especially in creative economies, in the 21st Century. During the course students will be encouraged to use the blogging and podcasting systems that they probably already use outside of the school, in order to improve their own musical and learning experience.

YouTube resources

YouTube is a tool for *video sharing* on the Internet. Sometimes a video can teach much more than an entire lesson at school (Fig. 5). The YouTube website has an incredible amount of visitors every minute.

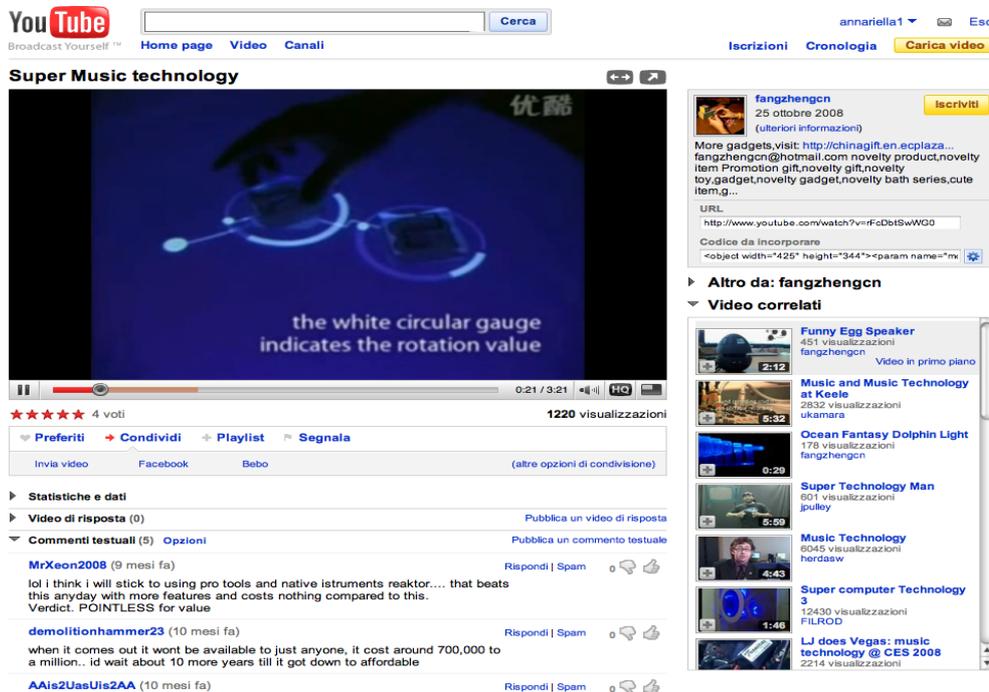


Fig. 5: A snapshot of a Youtube website showing how an innovative new musical instrument works.

The YouTube website is one of the favourite place where young people use to upload and share videos. Unregistered users can watch the videos, while registered users are permitted to upload an unlimited number of videos.

For our purposes, YouTube would be useful for student to upload their own work and to learn by seeing new way of thinking about music and moving image. Below we provide a list of suggestions of YouTube sites about cultural and artistic work, interviews with important musicians, performers and composers. These videos can be used in form of inspiration for their musical works.

Career challenges for Music Technologies:

<http://www.youtube.com/watch?v=fGJMNXMk6ak>

<http://www.youtube.com/watch?v=6glcY38btCk>

Creative Music Technology, experimental works (Bath University):

<http://www.youtube.com/watch?v=h9a54VXiPDU>

Reactable, Collaborative tangible interface by Pompeu Fabra University_

<http://www.youtube.com/watch?v=rFcDbtSwWG0>

<http://www.youtube.com/watch?v=aFF5ljgSJXE>

Modern minimalists presented by Bjork:

<http://www.youtube.com/watch?v=MixrSzIa264>

<http://www.youtube.com/watch?v=2QTxvmlA95Q&NR=1>

Multitouch surface as a MIDI controller:

<http://www.youtube.com/watch?v=XTuxa6ID51c>

<http://www.youtube.com/watch?v=0O70FrnH2JU> (Lemur Sequencer)

David Byrne, Playing the building:

<http://www.youtube.com/watch?v=Gea9SYUdJeY>

<http://www.youtube.com/watch?v=M1D30gS7Z8U>

Squarepusher electronic music and video art:

<http://www.youtube.com/watch?v=jKi4aeMnWrU>

<http://www.youtube.com/watch?v=DnZVY7ksMr0>

<http://www.youtube.com/watch?v=uZ0LL1SJ-6U> (BBC interview)

Aphex Twin electronic music and video art:

<http://www.youtube.com/watch?v=XzRtepSfzGE>

<http://www.youtube.com/watch?v=H4j9goCerOg>

MySpace Music

MySpace Music (part of MySpace) is a social networking website (Fig. 6). Each registered user (or group of users) has an own profile. MySpace profiles for musicians in the website's MySpace Music section differ from normal profiles in allowing artists to upload their entire discographies consisting of MP3 songs. The uploader must have rights to use the songs (e.g. their own work, permission granted, etc).



Fig. 6: A snapshot of the MySpace page of a musician showing a profile complete with an MP3 online player.

We suggest that every school sets up a MySpace page of the course/project. The students would be allowed to upload their music composed and edited during the courses, and video clips of lessons and rehearsals, for example.

Last.fm

Last.fm is a UK-based Internet radio and music community website, founded in 2002. It claims over 30 million active users based in more than 200 countries.

Users can create custom radio stations and playlists from any of the audio tracks in Last.fm's music library, and are able to listen to some individual tracks on demand, or download tracks if the rights holder has previously authorised it.

It will important also to broadcast the musical product through an internet radio as last.fm. In this way there will be also a direct connection between different schools involved within the project.

8. Material to be Produced During the Courses and Final Remarks

In order to collect material useful for the final presentation of the schools work elaborated during the project but also for evaluation during the project we suggest that we make it compulsory that each school feeds the E-motion consortium the follow material starting from the first lesson:

1. Video recordings of each lesson, especially the lesson with external teachers, but also teaching of internal teachers within the subject suggestions for Emotion will be welcome.
2. A MySpace website where students are allowed to upload their own projects and some little videos of lessons or rehearsals. It will be useful also to improve their way of present their works and their involvement to the project.
3. A Last.fm account where upload and broadcast the students projects (last.fm is an internet radio)
4. Create an YouTube school account to allow students in this project to upload videos about lessons but also some work of the students where music can be together with moving image.

All these materials will be used to evaluate and improve students involvement and general attitude with the tasks at hand.

It will be useful for the improvement of the involvement quality of each students. As we know young students are really proud on being on the Internet. It will be important to give them the possibility to show and share working progress music or videos. The videos we propose as “complementary methodology suggestions” [section 7 of “Elaboration of the Module – Definition of the programme (disciplines and time schedule)”] can be used as examples of what they can do with music or video.

We also suggest the integration of the video and musical projects into some sort of video documentary that could be presented at the final end-of-project meeting in Plymouth. One concerning perming question that needs to be further discussed during the Rome meeting concerns evaluation. Below is a quote from an email from one of the partners, who shares our concerns:

“In order for the experiments to be evaluated we will need that the specific school subjects to be addressed are determined for each experimentation centre. This must be jointly done by the team in the experimentation centre and the Plymouth team. Plymouth should ensure that some common patterns are present in all experimentation centres for the results to be comparable.

It is also essential that not just the contents are determined, but also the competencies to be acquired by learners. It is on the base of the competencies that the results of the experimentation are going to be measurable. Competencies must include at least the relevant pieces of knowledge, abilities and attitudes that learners must attain during the experimentation.

Once the list of competencies is established, the set of observations can be devised. As mentioned in previous reports, these observations must comprise both qualitative and quantitative methods. In this process we will have to ensure that some of the observations are common to the three experimentation centres. “

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[3] “ Growing up complete: the imperative for music education : the report of the National Commission on Music Education”, National Commission on Music Education (U.S.), R&L Education, 1991, (25)