



## THE NEW HORIZONS FOR MUSIC TECHNOLOGY IN MUSIC EDUCATION

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### Abstract

Modern technology is increasingly present in modern music education from the elementary school to the university level. Electric instruments are present in most well equipped music classrooms. Computers and the use of the Internet broaden the field of music education even further. Many different computer programmes and software developed lately make music-making, composition, and accompaniment, practice and improvisation easier and more meaningful. Music and music-making is becoming more informal learning.

The focus in this article is the phenomenon of music technology and the potential of the Internet in music teaching and learning. The broad field is approached through a review of the music of the second millennium, open social media and the phenomenon of network communities. The aim of research is to make a micro historical review of the music technology products and the Internet as developers and shapers of modern music education in Finland.

In this presentation we examine the potential of technology through practical applications for music education in school classes (formal and informal teaching). What help could we get from the Internet in learning instrument playing or collective music-making and playing? How could the pupils practise free accompaniment at home using a piano or guitar? How can students practise polyphonic choral singing using the Internet for assistance? What options does the Internet offer our pupils?

**Key words:** *music technology, education, WWW, Internet, online communities, collaborative musical activities, open media in music education, informal learning*

### AIMS

The changes to the curriculum increase pressure on classroom teachers. Simultaneously teacher education is descending the number of lessons for learning these important subjects: singing, instrument playing and using technology. How can a future teacher survive in this situation? In this article we consider the potential of modern technology to help teachers. We focus especially on the essential phenomenon of open music education technology in the Internet.

### METHODS

Our aim is to make a micro-historical review of the music technology products and the Internet as developers and shapers of modern music education. Our method is a review underlining the music of the second millennium and the phenomenon of open social media.



## INTRODUCTION

Music education technology is a young and an unestablished conception in the Finnish language. Usually "music education technology" means using technological applications in music teaching and learning, WWW and open learning environments. As a science, music education technology research concentrates on the phenomena in connection with music education technology in the modern information society. (Ojala 2006, 15.)

According to Ojala modern technology offers new versions of old tools and aims (2006, 16, 20-21). The technology is important but it is useless without the appropriate ability to use it. This means that the know-how and practical skills in the use of technology is the main core, while the technology mainly is the knowledge about it. Ojala further emphasises that music education technology does not mean replacing living music playing, music teaching and students with machinery, but it means developing, researching, and advancing new methods inside music teaching and learning – first of all growing in the use of modern technology. Once this serves approved, positive aims, it will become a part of culture.

Music technology may be approached from different points of view. It may be a pedagogical, educational point of view observing the effects on learning or it may be one concentrating on the technological basis

trying to develop pedagogically useful, practical and efficient solutions in teaching and learning music. Music technology can also be considered in light of its adequacy in the current curriculum and the working culture at school. We can also consider how the new ways of communication have changed and are invariably changing the whole music scene and its enculturation processes. (Salavuo & Ojala 2006.)

First of all, the salient music technological applications can be observed as a help and support for instrument learning (Salavuo & Ojala 2006, 31). Examples of this are the a) video mediated teaching (the master courses) and b) accompaniment programmes or other similar interactive music software. Secondly, the technology enables creative activities like a) children's composition projects and b) barrier-breaking projects where a voice landscape is formed based on a picture. Third point is the use of network teaching and learning in different projects. The fourth possibility is the use of multimedia materials in music education (WWW and CD-ROM). The fifth point of view would be integrating music technology into the curriculum and National standards.

Music technology has developed in tandem with the development media and communication technology. Table 1 shows the close connection between these two. New equipment and changing ways of expression have

**Table 1.** Decades of Finnish media and music technology education

1960 Popular liberal education	Audiovisual education	Film, television, newspaper, mass communication	Acoustic instruments
	Mass media education		
1970 Critical stance	Mass communication education	Television, mass media	Acoustic and electric instruments
	Communication education		
1980 Aesthetics, ethics	Communication education	Video, audiovisual culture, film, music videos	Synthesizers, music software for computers, computer-assisted music education, video-culture
1990 Networking, interaction	Communication education	Information technology, net technology, digital technology	Sequencer-, notation-, ear training-, music theory-, improvisation -, synthesis- and sound modification- and hypermedia software develop
	Media education		
2000 Multi-modal media culture	Media education	Digital technology, multi- modality	Social media, Internet music- making



also affected the worries and concerns of educators. (See Kupiainen et al. 2007, 22-23.) We should be especially concerned about the relationship between the school knowledge and the knowledge surrounding us, because according to Suoranta (2003, 12-13) the schools are suffering from both lack of knowledge and cultural significance. Thus, the borders between formal and informal learning vanish.

In the new millennium is it no longer as easy to crystallise the content of media education as it was in earlier decades. The preceding decades could be characterised by new technology: the 1950s were the era of the newspaper, the 1960s of television, the 1970s of mass communication, the 1980s of video and the 1990s of the computer (including e-mail and telematics networks) and the mobile telephone. Positions were taken on these in media education one way or another and an effort was made to respond to the "new challenges" they posed. At the beginning of the 2000s, new questions about media education and about young people's relation to media have once again emanated from the new media. With the new media and digital media the interest in media education continues to be increasingly a part of the media production of children and young people. (Kupiainen et al. 2008; Pohjola 2009.)

**Table 2.** Music in the Internet the past decades

1998 Google	2004 My Space
2000 Napster	2005 FaceBook
2001 Itunes	2005 Youtube
2001 Mikseri	2005 Tunecore, WE7
2002 Kazaa	2007 Amazonmp3
2003 Last Fm	2007 Teachertube
2003 PirateBay	2008 Knol

Table 2 lists some of the most interesting web pages of the last decade; many of the most popular pages (YouTube, MySpace and PirateBay) with a music connection are quite recent.

Many of the web-pages exploit a peer-to-peer network. A peer-to-peer computer network uses diverse connectivity between participants in a network and the cumulative bandwidth of network participants. These networks have made a mark in the public domain be-

cause they have become immensely popular. Mostly they are used to share music, movies and computer software through the Internet. In these networks much copyrighted material is distributed illegally, which has been noted by producers in movie and music industry. At this very moment, there are legal proceedings taking place against The Pirate Bay web-sites. Pirate Bay offers links to private user's computers, but does not maintain any files or data and does not send or supply them to anyone. (See Silverthorne 2004; Ahlroth 2009; Fairchild 2008).

It seems that the expertise in modern society has been widely spread and diffused. The Internet users may also work as the creators of new information and music. This is possible thanks to many domestic and international music content web-sites. In addition, different Wikipedia pages (see wikibooks and Knol) also include substantial music information.

#### THE WORLD WIDE WEB AS A MUSIC LEARNING ENVIRONMENT

The World Wide Web offers a significant amount of material suitable for music teaching and learning. According to Salavuo and Myllykoski (2006, 217-218), it suits best to independent and home music education. The use of the web requires a functional technical infrastructure, but also a certain level of technical ability and information-seeking skills from the user. The websites meant for music learning can roughly be divided as follows:

1. Pages offering information and illustrating materials;
2. Pages offering interactive problems and practices;
3. Dynamic pages built by web-communities, and
4. Pages introducing teaching and course syllabi and curriculum.

In Finland, the Guidonet website, which can be found from Movenet pages, has offered a versatile starting point for music learning and teaching in the Internet. As examples we mention pages on the following topics:

- Music history
- Bands
- Composing, producing and marketing music
- Lyrics and chord accompaniments for songs



- Music theory and ear-training pages for self-access learners
- Learning different instruments (see Chord Finder, Gootar, Wholenote.com, Siggi Merten, Mario Ajero etc.)

Many of the pages meant for music-making are also a form of marketing for bands promoting themselves. Often well-constructed pages lead the customer to other interesting websites. For example, in Wholenote.com there are almost three thousand guitar lessons. The pages offer a guitar enthusiast many kinds of practice material.

#### OPEN LEARNING ENVIRONMENTS AND WEB-COMMUNITIES IN MUSIC

A music teacher can begin the search in the "music jungle" of the Internet through the communal pages. For example sites like Harmony Central, The Sonic Spot or Version Tracker offer links, appraisals and free- and shareware software programs. Barlow (2006) has collected music technologic materials from different pedagogical workshops. Today, many "social bookmarks" (such as Facebook) also provide useful music software. We may well note that a student in need of information will surely find it from the Internet, but can it be found without searching?

According to Salavuo (2006, 65; 2006b), the essential idea of Internet teaching and learning is to widen the possibilities, to bring new flexibility and especially to decentralize the learning into communal processes. Music technology and networks can offer new additional value to music learning through representing information differently and joining it into a communal working context. Informal learning has widened and changed the area of learning in many ways according to many researchers (see e.g. Green 2002, 2008; Folkestad 2006; Burnard 2007).

Salavuo discovers (2006, 233) that the websites and networks including a user's own music and discussions about music are in a certain way like modern folk high schools or working people's free-time houses. Musical achievements take place there; they motivate young people in music-making and the pages work as self-organised and requirement based learning environments at their best. In net communities young people join together with enthusiasts who share both musical and social goals. New technology has also enabled the production of high level music performances

independently in small home studios with low costs. Salavuo (2006, 234) defines the "open music net community" as a www-page where independent (from record industry and copyright organisations) music-makers share and discuss their own music. One of the main principles of free net communities seems to be producing music for others to hear. This element also separates the music net communities from peer-to-peer networks which illegally share copyrighted music.

A popular Finnish net community is Mikseri.net which has about 60.000 registered members. The members have so far produced more than 60.000 pieces of music in the pages which have been commented on and criticised by others. (Salavuo 2006, 234-235.) Other similar net communities are for example: SoundClik.com, GarageBand.com, and PureVolume.com. Through these communities and servers anyone who knows music technology and has a net connection is able to get his own music heard all over the world.

Salavuo (2006, 235) also notes that to a school band it will be exciting and motivating to see that their music has been discussed and listened to by people all over the country or even all over the world ten, one hundred or even a thousand times. It is important for a teacher to be conscious of these net communities even if he or she is not interested in music education technology at all. We must remember that most of the pupils' music achievements take place outside school and that the Internet is a fundamental part of it. (Estrella 2005; Salavuo 2006, 237.) A music teacher can help pupils act in these environments by offering them the necessary skills, but also by teaching a critical attitude to information from the Internet. Ho (2004) states that when information technology (IT) is carefully planned, designed and integrated into good music practice in classrooms, it can support students' motivation and enhance the quality of learning.

#### THE ECSTASY OF PLAYING AND MAKING MUSIC

Social media and "Web 2.0" have made it possible to publish and engage in virtual networking on a global scale. The new Internet options including picture galleries, blogs, podcasts, YouTube, Second Life, Habbo-hotel etc. are a routine matter for young folks, but frequently a mystery to the older generation. Yet again the threats and almost unlimited opportunities of the new digital culture rears its head. In the discussion on digital games there has been an increasing trend towards



defending the new learning culture and experience afforded by the games and game characteristics and support has been sought from as far afield as neuroscience. When talking of media education in the 2000s there is no ignoring the contribution of games. Indeed, games have attracted the attention of Finnish researchers in both education and culture and technology. (Kupiainen et al. 2008.)

Making music and playing games are closely connected. It can be seen even in the word "play" which means both playing instruments or playing games. A pitch game, as characterised by Karaoke Revolution or the SingStar series, tests the player's ability to match the pitch of a piece of music provided by the game. Players use their voices and a specialised microphone as input and they are scored on their tonal accuracy. These games typically remain linked to rhythm as well due to the basic nature of rhythm in most music; however pitch games are characterised by comparatively simple rhythms and an emphasis on the pitch element of the songs instead. Singstar and Staraoke can be seen as teaching and learning instruments although they are commercial entertaining games. They focus on making music, singing. In Instrument Frenzy the player should sort out instruments falling from the ceiling depending on which instrument group to which they belong. We should become aware of the values, attitudes and information which the computer games include.

Different types of music games have become increasingly popular among young pupils (see Kallio et al. 2007). Tuuri (2006, 200) points out that a common argument for using the learning games is the positive and motivating effect they have on pupils. In the centre of the game enjoyment there is an experience called "game flow" which is born when the idea of the game, the difficulty and the possibilities of the game are in balance with the player's own skills building an intrinsic motivation (compare with Csikszentmihalyi 1996, 111-113). For example, The Guitar Hero franchise has become a cultural phenomenon, made many appearances in popular culture, and become extremely popular as a party game revolutionizing the modern music industry.

The potential of media culture has been multiplied in one decade and they are now according to Pohjola (2009), more than violent shooting and exploding games as they were before. The research by Pohjola and Johnson shows that living in touch with the modern media means joy and playing together, but also learning and guiding others in the use of new software. Modern children have been born in the middle of the

media culture and they cannot separate it from the rest of their life as older people may do. The public discussion about media usually focuses only on the effects and limitations of the Internet and media, not on the skills, knowledge and learning which they similarly produce. This is because the whole media culture is so young and new to most adults. The moralizing will diminish as the knowledge grows about the Internet and media, presumes Pohjola.

#### VISIONS OF THE FUTURE

Have the teachers at schools, universities and polytechnics been able to keep in touch with modern developments? Are we able to use the advances of the Internet in seeking information, selling and buying knowledge through the Internet? Is enough information systematically and openly available to teachers in their conferences and educational courses and workshops? Music educational technology undoubtedly changes teaching of music. The question is: in which direction? How does the music change, how will the teaching change and what have the social media added to music teaching and learning?

Informal learning has already become an important part of music learning. Significance will continually grow in the future as young people continue to concentrate on learning outside the school institution. How could a teacher take advantage of this informal learning? We may also ask to what extent is the media and music technology included in current curriculum? What are the consequences of network learning to a music enthusiast – a novice or an expert -learning musical instrument playing? Although computers can be used in teaching and illustrating different elements of instrument playing quite thoroughly, the control of manual skills and learning is more difficult, if not impossible. The multidimensional process of learning instrument playing is still mainly dependent on the living teacher and his or her control rather than a computer, however advanced the programs might be. Still, real-time video teaching or either direct or saved Internet broadcasts may bring teaching to distant areas where a qualified instrument teacher might be difficult to find (Compare Ruippo 2006; TeacherTube etc.).

The software built for making music has grown widely in last decade. The methods of making music differ throughout the software types. The main principle seems to be to enable the music maker to compose the whole song with only one program. Many of the



software producers also have built Internet websites full of songs created with the software in question. In practice, a music teacher should concentrate on the ease clarity of the software to enable usage by pupils. (Myllykoski 2006, 191.)

An interactive community works as an excellent information channel for discussion of different questions about software or any other musical problems. The Internet is very useful especially in self-access music learning as it is easy to find any information whenever it is needed (Järvelä et al. 2008). The Internet can be classified as a requirement-based learning environment. Those who are learning music using the Internet might easily also become producers of information. The Internet has become more and more a social and communal production media where participation and interaction, sharing products, co-operational and uncompelled production of music are typical (Facebook, Wikipedia, YouTube, TeacherTube etc.) The Internet is also a strategic place for marketing, selling and buying. In the music business the net shop Thomann has become a standard when people discuss the prices of musical instruments and compare them in Europe.

Music technology has become very close to people who do not have any formal music education or who do not know how to play any musical instrument. New "stars" may occur in the Internet in one night, and also through

the strangest areas (for example "Lasse Gjesten; Sweet Georgia Brown med traktorkomp"). It is interesting to follow the producers of software as they try to satisfy the needs of the large group of people wanting to learn more and more about music and music-making.

In the public debate the dangers and disadvantages of the Internet (for children) have often been underlined. However, to children themselves the Internet, digital games, television and other media are only a place for learning, a source of community and joy. In the school world the media culture has not been given much room, although at its best the media could lighten the schoolwork and teaching situations through bringing in a new, modern learning culture. (Pohjola 2009.)

The Internet environment has become step-by-step a kind of communal notebook, which pupils also can exploit in musical problem-solving. They can also build and visualise knowledge continuously creating new information suitable for them. (Edelson et al. 1996; Hakkarainen 2001, 29; Salavuo 2005.)

In Internet communities simple solutions, applications, services and tools are used more and more for supporting, producing, sharing, teaching, studying and communication. Blogs, wikis, podcasts and different hints, research and teaching networks will be an important part of the future teaching environment (see Ruismäki 1996). "The door is open, you just have to step in" is an old Chinese proverb referred to cleverly by Google Earth.

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