

# Competences for the Music-Technology Context on the Distance Learning

## *A Focus in the Use of Online Digital Technologies*

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Abstract: This article presents a case study about the competences for the music-technology context on the distance learning from the use of online digital technologies. Although most of these tools haven't been developed for educational purposes, this paper reports their use over education. The article also aims to map the necessary competences for students, teachers, musical tutors and outsiders in music to create their own musical digital compositions for their digital educational materials (DEM). The results of the research are presented in the end.

## 1 INTRODUCTION

Given the arrival of web based Technologies, especially the free ones, musical composition becomes available for either musicians or outsiders in music. Thus, it may be implied that it is no longer necessary to know how to play a conventional musical instrument to virtually create music, since computer performs this action. According to Iazzetta (2009), in accordance to Fritsch (2008), computer encompasses the functions of the musical instrument, amateur studio and performer, "[...] merging the separation of singing, listening and composition" (Iazzetta, 2009, p.158).

When treating about digital Technologies, Palfrey and Gasser (2011) say that they have been used in various fields of knowledge and with many functions in the society. Professionals need competences to perform on a more computerized world. According to the authors, due to the possibilities provided by the internet, there are indications that there will be extraordinary digital masterpieces<sup>2</sup> made by the Digital Native in the future. However, at the same moment that these new digital forms of art appear, there is a growing concern with the cyber culture of "[...] 'cut, mix and burn' (a CD or DVD) [...]" (Palfrey and Gasser, 2011, p.146).

In accordance to Palfrey e Gasser (2011), Ribeiro et al. (2011) points out that the use of Web 2.0 tools

may help in the creative process, once people create and interact on the contents of the web, by sharing intellectual productions, experience, information, etc. in Weblogs, Wikis, social networks and others.

However, according to Behar et al. (2013), the mere use of these tools does not assure a quality final product or excellence on the teaching and learning process. For the author, in order to have quality Distance Learning those who wish to compose through digital technologies need to build knowledge, competences and attitude. This way, they will be able to perform properly in the music-technology context. By means of a study<sup>1</sup>, it was tried to check what are the necessary competences for students, teachers and tutors to perform in the educational music-technology context. This research, which will be detailed in section 4, had its focus on online digital technologies with the use of computer. Those herein described are consisted of available resources at the internet, such as learning objects (LO) and the digital music tools dedicated that present the features of the Web 2.0. One of these features is the creation and sharing of own compositions. Online tools are software whose storage and sharing occur at the internet, also known as cloud computing. These resources have been used in the educational context, especially in the Distance Learning.

In the section 2 of this article, the factors that influence the development of competences for music

are presented, as well as the concept of musical composition and its relation to creativity. On section 3 the online resources are presented as learning objects, used as theoretical and didactic support either for distance learning or presential courses and subjects. Section 4 is regarding a case study to investigate the *educational* music-technology competences, developed upon the use of the Web 2.0 tools. In the end, the final remarks are exposed on section 5.

## 2 COMPETENCES FOR MUSIC: A FOCUS OVER THE DIGITAL MUSIC COMPOSITION

Tafari (2008), in accordance to Hargreaves (2000) and Stefani (2007), emphasize the importance of the people's interactions with the social, cultural and educational environments, for the development of competences for music.

Besides the influence of the social and cultural environments, Hargreaves (2005) and Tafari (2008), state that self-confidence may be primordial for the development of musical skills. For Dörge (2010), besides self-confidence, creativity, flexibility and autonomy are considered fundamental for the development of competences. For Tafari (2008), the way individuals notice and construe the information on the way to their brain depends on the knowledge, interest, attitude, personality, self-confidence, temper, and others.

Behar et al. (2013) is favorable to Tafari's (2008) and Hargreaves's (2000, 2005) ideas about the importance of the social, cultural and educational contexts for the development of musical competences. The author also agrees with Peretz (2006), who included the genetic influence. However, competences are more than competences, capacity or aptitude. It is understood, according to Zabala and Arnau (2010), as the mobilization of these elements, according to one's experience, psychological, cognitive and emotional formations in the social context where they are inserted.

### 2.1 The Musical Composition and its Relation to Creativity

According to Araújo (2006), on an attempt to find and identity for the teaching profession, came the need of specifying what are the knowings directed to the musical domain in the teaching and learning processes. The possibilities provided by the Web 2.0

allowed the exchange of information among students, tutors and teachers on a virtual environment and access to repertoires of many ages, styles and genres. Besides the download option and the listening of the musical repertoires at the web pages, it is possible to create your own digital media, integrating sounds, texts, images, songs in videos, presentations, etc.

Ribeiro et al. (2011), in accordance to Araújo (2006), claim that the social software of the Web 2.0 enable people to create, putting to practice learnings that were not possible before these technologies existed. For the author, the use of these tools may help in the creative process, since individuals create and perform over the web contents, taking advantage of the public intelligence. In accordance to these authors, these creative practices also occur in the musical composition with this type of software and are a result of a creative process of the individuals.

When referring to musical composition, Webster and Hickey (2009), Maffioletti (2005) and Guterres (2012) are favorable to the use of this practice as a pedagogical activity for the teaching of music. Guterres (2012) point out that the musical composition is a "make to understand" the musical contents. Webster and Hickey (2009) mention that

[...] in addition to the growing interest in improvisation and its role in musical development, compositional thinking as a strategy for teaching music has become a major force in countries such as Australia, the United Kingdom, and the United States. (Webster and Hickey, 2009, p.379).

According to Ribeiro (2011) the use of Web 2.0 tools may help in the creative process, since individuals create and perform over the web contents, taking advantage of the public intelligence. Araújo (2006) and Palfrey and Gasser (2011) claim the possibility of new forms of art coming from Native Digital individuals. Linking to these authors, it is possible to make creative music pieces through digital online tools. These tools will be exposed in the next section, and the online digital resources produced for the Distance Learning as well.

## 3 ONLINE DIGITAL TECHNOLOGIES RESOURCES AND TOOLS FROM THE WEB 2.0 THE DISTANCE LEARNING

According to Fritsch (2008) the synthesizers were

developing in a way an only one musician may compose in studio, perform and be the only audience of their own songs. These instruments are currently found virtually on software.

Given the above mentioned, the computer is the composition and execution instrument and the studio as well. With this facility, Webster and Hickey (2009) show that technological resources may help music teachers on many contents. They have a quick review over the studies that have been using this technology for reinforcement and comprehension of the music education related aspects.

We believe that this use of music technology can be a powerful aid for music teachers to reinforce, extend, and refine the expected development of music perception, performance, preference, and creating [...] (WEBSTER; HICKEY, 2009, p.383).

Authors classify various software according to: type, music content and age, from pre-school up to the adult age level. Among these authors, they point out the Vermont Midi Project for music creation. This project was pioneer using internet to facilitate musical collaboration.

On their conclusions, they point out studies that consider the use of music technology helps comprehending, which advances the development process of music learning and understanding in those that use it.

Behar et al. (2013) shows other software examples for the collaborative distance music composition programs, such as *Music-COMP<sup>2</sup>*, used in the United States. In the educational context, the author also mentions *Musit Interactive* and *jam2jam*. According to Seddon (2007), the former allows sharing the created music files, facilitating the social exchange among the participants. The latter, *jam2jam*, is a web based system for improvising, with functionalities that favor social interactions. (Brown and Dillon, 2007).

Hodges (2001) points that the Information and Communications Technology (ICT) includes “all forms of computer-based learning, and recognizes the importance of the Internet and associated communication technologies.” (Hodges, 2001, p.170). As for the use of technologies in teaching, he mentions about the importance to make a distinction between training and education. It becomes necessary because there is a difference between skills acquisition and conceptual understanding.

Another example that uses ICT in music education is mentioned by Smith (1999), in the secondary PGCE music course at Kingston University. A partnership between “training

providers and schools” has been made, because the music technology needs to be contextualized with the classroom and not just developing skills. She sustains there is a better approach between “educational theory and its application.” (Smith, 1999, p.197). In this music course “including delivery of music technology, has acquired an increasingly holistic emphasis.” (Smith, 1999, p.197).

Savage (2007, p.65) sustains that technologies “are transforming approaches to teaching and learning in primary and secondary schools.” The author mentions that especially within the field of music education there were changes. In spite of having a substantial range of new technologies, their use was limited due to the fact that it is linked to the traditional composition and performance.

Seddon and Bisutti (2008) researched about non-music specialist teachers. According to the research, non-music teachers usually present low-confidence to teach music in primary education. It may be explained because of the belief, especially in the western culture, that success in music requires inner talent.

In their conclusions, after the interaction with an e-learning environment teachers noted that music is not something special, only for gifted individuals. Thus, there is a break on the “cycle of low expectation” and the non-music specialist can provide opportunities to children to engage in creative musical activities in classroom. (Seddon and Bisutti, 2008, p.418).

As indicated by Behar et al. (2013), there are several online tools in open source for the musical composition that, although not being developed for educational purposes, have been used with this purpose.

Tools as Jamstudio, CODES<sup>3</sup>, MusicLab<sup>4</sup>, Tonematrix<sup>5</sup> and others have been used in extension courses in semi-presence and distance learning subjects at Universidade Federal do Rio Grande do Sul (UFRGS).

According to Behar et al. (2013) besides these available tools at the Web, online digital resources have been in development for the Distance Learning. Among them are the Learning Objects (LO) developed by interdisciplinary teams at the Núcleo de Tecnologia Digital Aplicada à Educação (NUTED).

Among the LO presented on section 3.1, the object Digital Music Composition – CompMUS<sup>6</sup> – will be detailed, since it was used in the case study on the present approach, aiming to map the competences for the music-technology educational

context.

### 3.1 CompMUS: A Learning Object for the Digital Music Composition

The CompMUS LO is an example of an online digital resource used in Distance Learning, whose purpose was to serve as a theory/pedagogical resource for the mapping of competences for the music-technology educational context.

CompMUS was developed in accordance to Amante & Morgado's (2001) methodology, which involves four steps: object conception, planning, implementation and evaluation. This object was developed by an interdisciplinary team, where the authors also participate. This object show 4 modules. Each module refers to an issue pursuant to the digital musical composition.

In modules 2 and 3 of this object have activities involving musical composition through CODES, MusicLab and Jamstudio tools. For the effect application and edit, the software Audacity is recommended. The digital interactive tools Tonematrix is found in module 4. The activity in this module consists of creating a podcast episode in pairs. It must have educational content and a soundtrack composed by the authors of the podcast using one or more online digital tools.

## 4 THE MAPPING OF COMPETENCES FOR THE MUSIC-TECHNOLOGY CONTEXT: A CASE STUDY

Aiming to investigate the competences for the music-technology context from the musical composition with the use of free digital tools, the case study was performed by an extension program course.

This course, named identically to the LO CompMUS: Digital Musical Composition for Education, was one of the tools used for the data collection.

The classes occurred in semi-presence and distance basis, with 80 hours' workload, on a weekly basis from April until June 2012. Two online questionnaires were applied, the first one to get information over the student's profile, their knowledge and experience in the music and technological fields; the second one was to evaluate the course and the LO. In order to register the testimonials and students' compositions the virtual

learning environment (VLE) Rede Cooperativa de Aprendizagem (ROODA)<sup>7</sup> was used.

Besides the use of the CompMUS LO as theory/pedagogical support resource during the classes.

The participants of the course were teachers from the public teaching network from various levels, music teachers, tutors, pedagogy and music students, post-majoring course students and Masters in a total of 17 students, where 9 were music teachers and 8 non-musicians.

As previously mentioned, the aim of the course was to develop a mapping of the necessary competences for the intended context. According to Brandão and Guimarães (2001), it is a technique linked to the knowledge management based on the staff and their functions. As for the function of this methodology, it is noticed a search for the identification of the already existing competences and the development of the necessary ones for an intended profile on a determined context.

Besides the main target, the study also aimed to investigate the profile of the participants of the research; the knowledge and prior experience of students about the technology and musical areas; analyze how they organize the sound material when compounding virtually and how CompMUS LO contributed to the development of competences for the intended context.

Based on the data collected, a concept map of the competences individuals shall develop for the music-technology context has been developed based on the results found, and is indicated on table 1.

However, it is proper to mention that many of these competences form were developed by the individuals during the extension course.

The importance of the development of instrumental performance and the Study of Theory and Musical Perception for the construction of specialized competences, inherent to professional musicians, is understood. Nevertheless, we emphasize that the competences listed are general ones, meaning they may be constituted by outsiders in music.

## 5 CONCLUSIONS

From the experiment performed, we understand that the use of digital online tools, as the ones used in this study, used on an integrated basis on virtual learning environments as well as learning objects, have potential to support in the development of competences for the music-technology context on

Table 1: Competences for the music-technology context from the use of digital technologies. Source: (Rosas and Behar, 2012, p.8)<sup>8</sup>.

KNOWLEDGE (K) <sup>1</sup>	SKILLS (S)	ATTITUDE (A)
- Know various audio formats	- Make and compound digital music in a public/ collaborative way;	- Opening to new sonorities provided by the digital technologies;
- Know effects for audio treatment;	- Convert audio format, liable of internet transmission;	- Self-confidence;
- Know the historical presuppositions of electroacoustic music;	- Setup the computer soundboard according to the operational system, the software and digital musical tools to be used as well;	- Capacity to motivate yourself and motivate others;
- Notions of simple music form and structure;	Use online, specially free software and tools for musical composition and production;	- Proactive (capable of controlling the structure and content on the CMD);
- Read and interpret virtual and multimedia messages;	- Use free software for audio recording, editing and mixing;	- Flexibility for changes;
- Notions harmony and chords ordination on the western tonal system to organize the sounds at musical digital composition;	- Use Information and Communication Technology (ICT);	- Be responsible for the ICT use;
	- Install and uninstall musical software;	- Autonomy;
		- Opening to several musical languages, from classical, pop to contemporaneous.

Distance Learning. The knowledge, skills and attitude herein presented may be built by teachers, students and music tutors who own little or no experience within these technologies or by teachers and students outsiders in music, who wish to perform on this context, with or without prior technological experience.

When making the competences mapping, besides observing those existing and pointing out the necessary ones, it was found that part of the knowledge and competences presented on table 1 were developed at the moment their compositions were being created, when interacting with CompMUS, with the teacher and the classmates over the VLE (Virtual Learning Environment) during the classes.

We believe continued education courses are necessary, in order to prepare these individuals to perform on this context, developing knowledge, competences and the necessary attitude for the music-technology context.

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1 Case Study at the Post-Majoring Program in Education at Universidade Federal do Rio Grande do Sul, Brazil.

2 *Music Composition Online Mentoring Program*. Retrieved from: <http://www.music-comp.org/>.

3 Cooperative Music Prototype Design. Prototyping refers to musical creation. According to Miletto et al. (2005) this expression is not known in the music area and was used to highlight the differences between compositions made by musicians and the experiments and creations made by outsiders in music.

4 <http://clubcreate.com/#!/studio/musiclab>

5 <http://lab.andre-michelle.com/tonematrix>

6 [http://www.nuted.ufrgs.br/objetos\\_de\\_aprendizagem/2011/CompMUS/](http://www.nuted.ufrgs.br/objetos_de_aprendizagem/2011/CompMUS/)

7 <https://ead.ufrgs.br/rooda/>

8 Table translated by authors.