



V Conferência Ibérica de Inovação na Educação com TIC

## ieTIC2019: Atas da Conferência

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Instituto Politécnico de Bragança  
2019

## Experiências de criação musical no ensino básico Musical creation experiences in primary education

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### Abstract

The aim of the study is to analyse the implications of digital technologies of sound as generator element of sound art and transforming tool of teaching and learning music. The participants (n=42) development three musical creation experiences with use of different software's. The study employed a qualitative and interpretative approach. Participant observation, field notes, photographic/audio records as well the written and musical production participants were used. The results indicate that the incorporation of digital technologies of sound in the processes of musical creation leads to the discovery and expansion of new languages and codes, construction new imaginary territories and new challenges in the processes of collaborative musical composition that undoubtedly enrich all the artistic experience and the entire teaching-learning process.

**Keywords:** *Technology; music composition; music.*

### Resumo

O objetivo do estudo é analisar as implicações das tecnologias digitais do som enquanto elemento gerador de arte sonora e ferramenta transformadora de ensino e aprendizagem musical. Os participantes (n = 42) desenvolveram três experiências de criação musical através do uso de diferentes softwares. O estudo utilizou uma abordagem qualitativa e interpretativa. Foram utilizadas a observação participante, notas de campo, registros de fotografia/áudio, bem como a produção escrita e musical dos participantes. Os resultados indicam que a incorporação de tecnologias digitais de som nos processos de criação musical leva à descoberta e ampliação de novas linguagens e códigos, construção de novos territórios imaginários e novos desafios nos processos de composição musical colaborativa que, sem dúvida, enriquece toda a experiência artística e todo o processo de ensino-aprendizagem.

**Palavras-chave:** *Tecnologia; composição musical; música.*

### Background

The technological progress challenges us to transform the concepts, perspectives, paradigms and practices (performative and compositional) belonging to contemporary artistic and educational activities (Brown, 2015; Savage, 2007; Webster, 2002; Katz, 2004; Young, 2009; Bauer, Reese & McAllister, 2003; Estrella, 2005; Ruismäki & Juvonen, 2009). Friedman (2006) say that the technology is a contributor to flattening the world. Definitely, technology affect the way people live and work (Bauer, 2014). Is everywhere in our culture. In music context (formal and informal teaching), the technology has emerged with unprecedented speed, allowing the enlargement of boundaries of timbre, perception, new instruments and the

forthcoming of new ways of experience, compose, consume and perform music (Ruthmann & Mantie, 2017; Bauer, Reese & McAllister, 2003; Estrella, 2005; Ruismäki & Juvonen, 2009; Heuser, 2015). In the book *When Things Start to Think*, Gershenfeld (1999) state,

It used to be that people played music, because that was the only way to hear it. When mass media came along, society split into a small number of people paid to be artistically creative and a much larger number that passively consumes their output. Reducing the effort to learn to play an instrument... points to the possibility that far more people will be to creatively express themselves. Improving the technology for making music can help engage instead of insulate people. (p.43)

For Heuser (2015) technology *always influenced music* (p. 155). The new proposals of make music enable us to increase the paths and the artistic/pedagogical alternatives that open unexplored spaces and where the curricular units transform to provoke permeable cracks that push the imagination to other artistic and educational possibilities loaded with innovation. However, for Rudolph (2004) is fundamental to find the place and the purpose of technology in music education before *beginning to properly apply the technology* (p. 4).

The new technologies provide many opportunities and entryways to reinvent the nature of performance and music creation in the field of music education (Bauer, Reese & McAllister, 2003; Estrella, 2005; Ruismäki & Juvonen, 2009; Ruthmann & Mantie, 2017). In this particular, Delalande (2004) says that the new technologies open a set of possibilities and reinforcing the existing methodologies. For Pepler (2017) this positive vision radically shifts *the lines between performer, listener, and composer* (p. 200). In the current music programs the technologies can be a catalyst to expand these programs into more *comprehensive, imaginative experiences that ultimately develop active, independent music creators, listeners, and performers* (Brophy, 2001, p. 42). The use of digital instruments (new sounds and effects) and software's to create printed notation and to making music reveals that technology is an integral part of the way music is created, performed, preserved and consumed. This proximity implied the transformation of thought, processes and visions of the world. For Bauer (2014) technology *is enabling individuals to be musical in variety of ways, even without a formal musical background* (p. 7). This argument is shared by the *Music Commission* set up by the *Arts Council England* and the *Associated Boards of the Royal Schools of Music*. In your report the commission highlights how technology allows the current generation of music learners to explore, access and merge music from any culture, to enabled young people to improvise (together), and access to virtual teachers and confront each other in digital space. However, the report alert to the danger that the *disconnect between how young people use technology and music education may see current models of teaching rapidly becoming outdated*. Definitely, in the process of teaching and learning music, technology is an important partner in performance an essential asset in music composition. For Brown (2015), music technology

can be an amplifier of one's musicianship, enhancing musical skills and increasing musical intelligence (p.6) Is an important and effective tool to facilitating the student learning (Tamim et al., 2011; Bauer, 2014) and *can change not only the "how" of teaching and learning but also the "why", "what" and "where" of music learning* (Brophy, 2001, p.42). However, the technology can create the *illusion of sophistication without nuance* (Rudolph, 2004, p.12). In this particular, Peter Webster (2002) states,

So, is music technology effective and is it worth the trouble? On balance and on a very basic level, the answer to this question is yes. Does music technology hold the key for solving all our music teaching problems? Of course not. Are there abuses in its use? Absolutely. Does it always improve learning? No, much depend on the context – especially the teacher and its use instructionally. Is it worth the trouble to keep studying its role in music teaching and learning? Unconditionally, yes. (p.416)

Understanding music classroom as a space for experimentation and sound manipulation, where the composition as a meaning-making process *is fundamental to the intellectual, social, and emotional life of the child* (Barrett, 2003, p. 3), this study aims to analyse the implications of digital technologies of sound as generator element of sound art and transforming tool of teaching and learning music. The research design was divided into two complementary components: (1) theoretical dimension (focused on the analysis of fundamental concepts related to musical composition and digital technologies, aiming at points of synchronisation and transversality); (2) technical dimension (experimentation of musical composition processes with digital technologies of sound has a generator element). The linkage of these two dimensions allow to construct new forms of artistic and educational approaches in the context of music education classroom.

## Methods

Considering the aims that guide this study we defined a research design that allowed consecutive processes of (des)construction among the entire theoretical/technical dimension and the several elements (musical work) that stand out from the empirical research and in which the principles of totality are manifested (understanding the musical work as an open, dynamic and global system), recursion (predicting the dialogical relationship of its elements) and transformability (development of the relationship itself). The methodological procedure passes through the case study (analysis, synthesis and creation) of creative musical experiences developed in a school of 2nd cycle of basic education from the northern region of Portugal in the year of 2017/2018. The overall sample consisted of 42 students. Eligible participants underwent an 18-weeks assessment period. Each creative music experiment had the duration of 6-weeks and participants use different software's development by Brian Eno and Peter Chilvers (*Scape* - generative music app), Rui Penha (*Polissonos* – a loop-based midi sequencer)

and Filipe Lopes (*POLISphone* – music performance software) to generate, create and perform music. Participants were divided into small groups to complete each experience. This organization had always in its base the specific nature and needs (groups of instruments or limitations of didactic materials) inherent to the tasks. Mixed methods were used to collect, analyse and evaluate the application of creative musical experiences (Bryman, 2006). Participant observation, field notes (described and reflective), photographic and audio records (Amado, 2017; Bodgan & Biklen, 2013; Bryman, 2006; Máximo-Esteves, 2008; Trochim, 2000; Tuckman, 2005), as well the written and musical production of the students were used. The triangulation of the collected data acquired a fundamental role in the generation of multiple perspectives, which revealed an essential strategy in its understanding (Amado, 2017; Kemis & MacTaggart, 2005; Bryman, 2006; Trochim, 2000; Tuckman, 2005). Regarding the analysis of the compositional processes of the students of the 2nd cycle of basic education present in the various musical compositions, we used the analysis matrix proposed by François Delalande (2017) centered on decision levels and the discovery/work axes. A relevant factor for the application of this matrix, was undoubtedly the structuring of all the activities/tasks of musical creation developed in the two classes of the 2nd cycle of basic education that allowed to perceive the processes intrinsic to the musical creation. The transcripts of the music compositions, justifications or comments used by the students in the different creative musical experiences were subjected to content analysis (categorization and codification) in MAXQDA (software for qualitative and mixed methods research). Respecting the ethical-deontological principles of the *Ethic Letter* of the *Portuguese Society of Educational Sciences*, all the participants were informed about the objectives and procedures of the investigation. All the rights relating to anonymity and confidentiality of the empirical data have been guaranteed to all the participants (Amado, 2017; Bodgan & Biklen, 2013; Bryman, 2006; Trochim, 2000; Tuckman, 2005).

## Discussion

A key element throughout the creative musical experiments development in the classroom was undoubtedly the introduction and the use of digital technology as an essential tool during the process of musical composition (Ruthmann & Mantie, 2017; Miller, 2004; Savage, 2005; Cain, 2004; Wise, Greenwood & Davis, 2011). According to Delalande (2017), teaching in these age groups and the use of software for processing, editing and sound mixing allows to develop the autonomous musical composition capacity of the students. These technological tools play also an important role in acquiring and consolidation of elementary musical

concepts (melody, harmony, rhythmic and form). The mastery of these technological tools approximates the student of a peculiar universe of the amateur composition. Some studies show that the musical composition in the computer, in an amateur way, became a recurring practice. Delalande (2017) considers it essential to approach the *making musical school and the reality of a society with expressive number of amateur composers* (p. 31). Today, the informal music learning became an important part of the music teaching and learning (Ruthmann & Mantie, 2017; Green, 2017; Ruismäki & Juvonen, 2009). In this particular, the software's built for making music has grown and become very close to young people who do not have any formal music (knowledge of musical theory or know how to play musical instrument). Most of the student's music achievements take place outside the school. The social media and the World Wide Web (specifically the web-communities in music) have a fundamental part of it (Estrella, 2005; Ruismäki & Juvonen, 2009; Ruthmann & Mantie, 2017). In this particular, Webster and Williams (2017), state that,

Engaging students in music technology projects that involve music and the consideration of social context is a way for students to understand their own musical identities and develop a deeper understanding of social injustices. Such activities serve to bridge the moat between the music they experience within and without the classroom. Social media sites, collaborative networks for music distribution and performance, and other technical means for students to interrogate the music and the technologies themselves are all important for a richer music education that transcends the classroom (p. xvi).

During the work sessions it was possible to verify the influence of the social context and see their own musical identities. Many of the participants had some initial musical knowledge and demonstrate nearness to electronic music.

The analysis of the data unveiled that the musical compositions performed by the students were focusing on the 1st level of decision of the Delalande matrix. Despite the clear intentionality of the purpose of its works, visible in the existing verbalizations and/or justifications of the leaves that accompanied all the tasks developed in the music classroom. We think that the most difficulty was finding a starting point sound (find the sound or soundtracks related to the theme or element that is at the base of composition). Note that this issue is essential to start and develop the entire composition. The remaining decision levels (stylistic and technical rules), have not been visible in any justification or reference to these elements during the process of construction and presentation of musical compositions. This fact puts the compositional process in a spontaneous level of discovery and exploitation of musical ideas. It should be noted that this concept (musical idea) has its own history. Delalande (2017) considers the musical idea as a sound singularity that we find at random or



as the result of a research. The important thing is that we find it, even in thought. He adds that an significant characteristic of this singularity is its stimulating role in the development of compositional work itself. Often, this development means repetition at the same time that other changes are happening. In this perspective, a single note that contemplates a set of specific attributes (variation of duration), can be a memorable idea. Paynter (2010) sees in this understanding, a starting point from which we can extract and develop special qualities. For the author, the musical idea is like a seed, which *contains resources that will be transformed into distinct characteristics of what grows from it* (p.67). Objectively, a musical idea can be something as simple as a very short figure or motive. In the different creative musical experiments, we expected to find a more elaborate appropriation of terminology, vocabulary, concepts, symbology and its application in the processes of musical composition and interpretation. The strategies demonstrated by the participants regarding the emergence of musical ideas and their exploitation are solely associated with the choice of sounds that constitute their compositions.

Another shift that the analysis has made clear is that the development of creative musical experiences in small groups favored the collaboration among students (Jeffrey & Woods, 2009). This strategy has enabled the enlargement of relations in the classroom context (reinforcing and contributed to new the relationships of friendship among its constituents). One important factor is that the collaborative process of musical creation is undoubtedly a moment of exploration, sharing and negotiation of ideas. Some of the musical ideas play a significant role and begin to integrate the musical composition. This whole process of group work allows participation and favors musical learning, since it involves decision making, negotiation and active participation in learning. In this particular, Sawyer (2008) considers that the activities that socially involve students in collaborative work processes contribute to effective learning. It is important to emphasize that the musical creation experiences carried out in small groups trigger collective participation and also co-participation, especially in the moments of presentation, discussion and analysis of musical compositions (Barret, 2006). In these moments the students bring their knowledge to the classroom (making, speaking and thinking music) and cause the class co-participation in the work. In this context, it was possible to observe the importance and repercussion that musical production had in the group, mainly in the use and application of concepts and musical content, some of them with a certain complexity in their definition. Another point of prominence is the role that co-participation has in the process of deepening the musical comprehension (Beineke, 2009; Craft, Cremin & Burnard, 2008). A fact that results from attentive listening, understanding of the musical creations of colleagues and the contribution of their own ideas. The reflection on

the compositions itself is a fundamental component in the process of making and giving meaning to music (Barret, 2003; Wenger, 2008). The presentation of the musical creations of the students to the other colleagues is an activity inherent to the nature of the music itself. Without the presentation, the rendering process is not finalized. It is not enough to compose a song it is necessary to touch it. This moment of presentation at the end of each of the actions took place as a space of sharing and reflection on the options and performances of the various groups. This space contributes to strengthening of interpersonal and intrapersonal relationships, allowing students to become active agents in learning. The moment of presentation and discussion of the works is assumed as a vehicle for sharing meaningful musical experiences that allows learning from the work of others and recognizing/valuing their own work (Small, 1999). We can affirm that the construction of social relations in the classroom is clearly associated with the forms of participation established in the class and above all by the dynamics of work proposed by the teacher.

## **Conclusion**

The results indicate that the incorporation of digital technologies of sound in the processes of musical creation leads to the discovery and expansion of new languages and codes, the construction of new imaginary territories, open new learning environments/communities and new challenges in the processes of collaborative musical composition that undoubtedly enrich all the artistic experience and the entire teaching-learning process. The creative experiences carried out in the context helped the musical understanding because the uses of the varied practices within the classroom were important to clarify, correct and consolidate some of the student's knowledge. The diversity of the stimuli used in the course of the tasks that constituted the different experiences of musical composition allowed to bring to the classroom the relationship among music and other artistic areas, which undoubtedly contributed for stimulation and consolidation of musical ideas. This puts technology as a generator/catalyst element of sound art. Through the tasks developed in the classroom, the students reinforced their experiences and expanded their knowledge through other spaces and sound places. Digital technology is an indispensable element in the music education process favoring creativity and the combination of emotional and rational aspects. Definitely, the digital technologies of sound were a generator element of sound art and a transforming tool in the process of teaching and learning music. In this context, the role of the teacher will be fundamental, namely in the construction of social relations, appreciation of student contributions and promotion in classroom context of learning processes marked by sharing,



making and thinking music. Is important in this process that the teacher *consciously contextualize technological changes, develop appropriate music making activities, and provide adequate opportunities for reflection* (Brown, 2015, p. 13). We can say that the use of technology in classroom change “how” we see musical experiences.

## References

- Amado, J. (2017). Manual de investigação qualitativa em educação. Coimbra: Imprensa da Universidade de Coimbra.
- Barret, M. (2003). Freedoms and constraints: constructing musical words through the dialogue of composition. In M. Hickey (Ed.), *Why and how to teach music composition; a new horizon for Music Education* (pp. 3-27). Reston: MENC.
- Barret, M. (2006). Creative collaboration: an eminence study of teaching and learning in music composition. *Psychology of Music*, 34(2), 195-218.
- Bauer, W. I. (2014). *Music learning today: Digital pedagogy for creating, performing, and responding to music*. New York: Oxford University Press.
- Bauer, W. I., Reese, S., & McAllister, P. (2003). Transforming music teaching via technology: The role of professional development. *Journal of Research in Music Education*, 51(4), 289-301.
- Beineke, V. (2009). *Processos Intersubjetivos na composição musical de crianças: um estudo sobre a aprendizagem criativa* (Tese de Doutoramento, Universidade Federal do Rio Grande do Sul). Retrieved from <http://hdl.handle.net/10183/17775>.
- Bogdan, R., & Biklen, D. (2013). *Investigação qualitativa em educação*. Porto: Porto Editora.
- Brophy, T. (2001). Developing improvisation in general music classes. *Music Educators Journal*, 88(34), 34-53.
- Brown, A. (2015). *Music Technology and Education*. New York and London: Routledge.
- Bryman, J. (2006). *Mixing Methods: qualitative and quantitative research*. USA: Ashgate.
- Cain, T. (2004). Theory, technology and the music curriculum. *British Journal of Music Education*, 21(2), 215-221.
- Craft, A., Cremin, T., & Burnard, P. (2008). Creative learning: an emergent concept, In A. Craft, T. Cremin & P. Burnard (Eds.), *Creative learning 3-11: and how to document it* (pp. xix-xxiv). Sterling: Trentham Books Limited.
- Delalande, F. (2004). Musical education in the new technologies age. *Comunicar*, (23), 17-23.
- Delalande, F. (2017). Pedagogia da criação musical hoje: partir da infância, passar pela adolescência e ir além. *Revista Orfeu*, 2(2), 13-30.

- Estrella, S. (2005). Preparing tomorrow's music teachers. *Music Education Technology*, 3(4), 10-17.
- Friedman, T. L. (2006). *The world is flat: A brief history of the twenty-first century*. New York: Farrar, Straus and Giroux.
- Gershenfeld, N. (1999). *When things start to think*. New York: Henry Holt & Co Inc.
- Green, L. (2017). *Music, informal learning and the school: A new classroom pedagogy*. London: Routledge.
- Heuser, F. (2015). Understanding the tools: Technology as a springboard for reflective musicking. In C. Randles (Ed.), *Music Education: Navigating the future* (pp. 155-166). New York: Routledge.
- Jeffrey, B., & Woods, P. (2009). *Creative learning in the primary school*. London: Routledge.
- Katz, M. (2004). *Capturing Sound: how Technology has changed Music*. Los Angeles: University of California Press.
- Kemmis, S., & McTaggart, R. (2005). *Participatory action research: Communicative action and the public sphere*. Newbury Park: Sage Publications Ltd.
- Máximo-Esteves, L. (2008). *Visão panorâmica da investigação-acção*. Porto: Porto Editora.
- Miller, B. (2004). Designing compositional tasks for elementary music classrooms. *Research Studies in Music Education*, 22, 59-71.
- Paynter, J. (2010). *Sonido y estructura*. Madrid: Ediciones Akal, S. A.
- Pepler, K. (2017). Interest-Driven music education: Youth, technology, and music making today. In S. Ruthmann & R. Mantie (Eds.), *The Oxford Handbook of Technology and Music Education* (pp. 191- 2002). Oxford: Oxford University Press.
- Rudolph, T. (2004). *Teaching music with technology*. Chicago: Gia Publications, Inc.
- Ruismäki, H., & Juvonen, A. (2009). The new horizons for music technology in music education. *The Changing Face of Music Education. Music and Environment*, 98-104.
- Savage, J. (2005). Working towards a theory for music technologies in the classroom: how pupils engage with and organise sounds with new technologies. *British Journal of Music Education*, 22(2), 167-180.
- Savage, J. (2007). Reconstructing music education through ICT. *Research in Education*, 78(1), 65-77.
- Sawyer, R. (2008). Learning music from collaboration. *International Journal of Educational Research*, 47(1), 50-59.
- Small, C. (1999). Musicking: the meanings of performing and listening. *Music Education Research*, 1(1), 9-21.

- Tamim, R. M., Bernard, R. M., Borokhovski, E., Abrami, P. C., & Schmid, R. F. (2011). What forty years of research says about the impact of technology on learning: A second-order meta-analysis and validation study. *Review of Educational Research*, 81(1), 4–28. doi: 10.3102/0034654310393361.
- Trochim, W. (2000). *The Research Methods Knowledge Base* (2ª Ed.). Cincinnati: Atomic Dog Publishing
- Tuckman, B. (2005). *Manual de investigação em educação*. Lisboa: Fundação Calouste Gulbenkian.
- Webster, P. (2002). Computer-based technology and music teaching and learning. In R. Colwell & C. Richardson (Eds.), *The new handbook of research on music teaching and learning* (pp. 416-442). Oxford: Oxford Press.
- Webster, P., & Williams, D. (2017). Foreword. In S. Ruthmann & R. Mantic (Eds.), *The Oxford handbook of technology and music education*. Oxford: Oxford Press.
- Wenger, E. (2008). *Communities of practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press.
- Wise, S., Greenwood, J., & Davis, N. (2011). Teachers' use of digital technology in secondary music education: illustrations of changing classrooms. *British Journal of Music Education*, 28(2), 117-134.
- Young, S. (2009). Towards constructions of musical childhoods: Diversity and digital technologies. *Early Child Development and Care*, 179(6), 695-705.