GENERAL PROJECT INFORMATION

1. Title of project

   The Music Paint Machine. An embodied constructivist approach to technology-enhanced instrumental music instruction

2. Participants of the project (full names and position) (please indicate the main applicant/contact person)

   Contact person:
   Luc Nijs, PhD student (IPEM, Ghent University) & clarinet teacher (Grimbergen, Gentbrugge)

   Collaborators in the project:
   Bart Moens, Phd student, Ghent University (contribution: software programming)
   Pieter Coussément (contribution: software programming)
   Ivan Schepers, technical staff, IPEM, Ghent University (contribution: development of hardware and technical support)
   Prof. Dr. Marc Leman, director of IPEM, Ghent University (contribution: supervisor)
1. **Articulation and impact of the project in the field. How is the project responding to a real need in the field? (maximum 500 words)**

The project:
This project entails the development of a pedagogical, technological and empirical framework for the design, implementation and evaluation of an interactive music system for instrumental music education. In the course of this research we have developed the Music Paint Machine, an innovative interactive music system that allows a musician to make a digital painting by playing a (traditional) musical instrument and by moving the body. Based on a combination of educational constructivism and the theory of embodied music cognition, we have proposed a novel approach to the integrative use of movement, sound and visual feedback when learning how to play a musical instrument.

For more information on the system: http://mpm.dko-research.be/

Relevance:
Instrumental music instruction has a long tradition of teaching young people how to play a musical instrument. In recent years, the traditional ways of teaching and in particular its alleged characteristics such as a master-apprentice model of teaching, a primacy of the score and an alienation of the learners' reality of daily life, have come under scrutiny.

The critical aspirations with regard to music education have been articulated in a recent report by Anne Bamford, who was commissioned by the minister of education (Mr. F. Vandebroucke) to conduct an evaluative study on the nature and impact of Flanders artistic and cultural education. This report has led to the planned reforms of the Flanders formal music education system. The presented research project responds to the need of innovating music education as expressed by many music educators and summarized in Bamford's report. The research project also responds to the need of integrating more ICT in schools. In particular, the project appeals to the need for "an update of music education" (Action Plan for Music in Flanders, p. 3, 9°) and to the need for "research about new developments and applications within the domain of new media" (Action Plan for Music in Flanders, p. 3, 13°)

Impact:
At this moment the total impact of the project is still limited. Further steps are planned to integrate the Music Paint Machine in different music schools. These steps include workshops, presentations and experiments with teachers. Currently, a project is being setup to develop the Music Paint Machine into a plug and play device for teachers and students.
2. What type of network did you establish? How strong is your network and how well did it work?

Through the different experiments and presentations, we have worked together with many students and teachers. Collaboration was also setup with different organisations (e.g. IVME, Gehrels), cultural organisations (e.g. wind bands) and music schools (e.g. Grimbergen, Gentbrugge, Izegem). These collaborations worked very well and encourage to setup further collaborations. Collaboration with OVSG is under negotiation.

An international network was setup through contacts during conferences and through participation in meetings (e.g. at IMERC, London; as occasional member of the liaison board of MIROR project).

The network is also established by being board member of different organizations (e.g. FCME/Klankendaal, IVME), through the membership of different other organizations such as VFO(Vlaams Forum voor Onderwijsonderzoek), ISME (International Society of Music Education), SIM (Society of interdisciplinary Musicology). Finally, networking is established through participation in think thanks (e.g. meLab (University of Louvain), IPEM (Ghent University)). We believe the established network is strong and will support the further continuation of the project towards a larger impact.

3. What is the collective and/or shared development of researchers and practitioners involved in this project?

A major aim of the presented research project was to connect to the field of practice. An important advantage was the researcher's experience as a teacher in music academies for about 15 years. The research was presented to colleagues in order to discuss its relevance and to gain insights on their ideas and aspirations. This dialogue with colleagues was esteemed very important because it stimulates the debate on the gap between research and practice and makes research more available to the practice community. Next to the dialogue with teachers, it was assumed that the connectedness with the field is a matter of (re)defining the role of teachers within educational research. We believe that our research is a step in the good direction, mainly because of the concern with the practical relevance of the system. Based on a user study with the Music Paint Machine, teachers' opinion on the didactic potential was probed in order to gain understanding of the system's practical relevance. A longitudinal study, in which children learned to play the clarinet with the support of the Music Paint Machine, was conducted with the researcher as teacher. This study did not involve other teachers but it aimed at bringing the research to a naturalistic setting and as such, we believe, it gained practical relevance. We believe that the adopted combination of a researcher-teacher approach with a non-equivalent control groups design is a promising way to continue the research. Furthermore, a recent pilot study involved other teachers and aimed at understanding the process of technology integration. Following the teachers through observation, questionnaires and focus groups was a way of involving the teachers as vital interlocutors in the development of the Music Paint Machine and the didactic practices with the system. Future projects will expand the method used in the pilot experiment. In future experiments, teachers will be asked to participate in the design of the experiments. In this way they will no longer be mere participants but co-constructers of empirical studies.
4. Degree of dissemination: what type of products did the project has as output, e.g. publications, tools, websites, presentations, … (maximum 400 words)

Tool: the Music Paint Machine: software

Publications (on the Music Paint Machine):


Related publications:


Presentations:

Mainly on conferences (e.g. CSEDU2010), workshops (e.g. IRCAM/IPEM, 2011) and pedagogical study days of different music schools.

5. What is the sustainability of these products?

We believe that the further development of the Music Paint Machine into a plug and play device for teachers and students, will lead to an educational application that can be used by many teachers and learners in order to fully develop their music musical abilities. Results from our user study indicate a high relevance of the system and we believe that this relevance will support its sustainability in educational practice.
Furthermore, during our longitudinal study, different practices with the system were developed. Because of the control groups design of the experiment, these practices were developed in such a way that they could also be used without the system. The practices will be implemented in a method book for learning how to play an instrument. This method book will not focus on one instrument, but provide teachers with exercises that can be adapted to different instruments. It will also contain guidelines to do the exercises with the support of the Music Paint Machine. This will contribute to its sustained use.

Another important incentive to the sustainability of the project is the researcher's (Luc Nijs) part-time assignment as a clarinet teacher in two music academies. This assignment creates opportunities to do practitioner research and to collaborate with other colleagues.

The researcher will also continue this project as researcher at IPEM (Ghent University).

6. Motivation: Why does your project deserve to win the EAPRIL Best Research and Practice Award (maximum 400 words)

Winning an award is, besides being an appreciation for the work done, an important incentive for the community to help creating new possibilities in order to bring this project to the next level. We believe that the project with the Music Paint Machine deserves the EAPRIL Best Research and Practice Award because of its innovative approach within the domain of music education, and in particular of instrumental music instruction. Currently, projects that thoroughly integrate teaching and researching do not exist within this domain. Winning the EAPRIL Best Research and Practice award would not only give an important impulse to continuation of this research, but it would also stimulate the positive appreciation of research-based educational projects in which researchers, teachers and learners collaborate to setup practitioner research projects. In our opinion, music education in Flanders is urgently in need of such projects in order to support ongoing reforms. Winning the Award would give us the voice to actively plead for more scientific investigations in the domain of music education, based on practitioner research.

7. Describe, in three bullet points, the lessons learned during the course of the project you would like to share with the EAPRIL community.

- The research- and practice-based development of educational technology urges to (re)consider the pedagogical principles that underly didactic practices and stimulates the development of novel didactic approaches.
- (music) Educational technology research needs to focus on the transformative impact of technology. Therefore it must be pedagogy-driven, rather than technology-driven.
- Researchers, teachers and learners need to collaborate in order to establish ecologically valid research.