SUMMARY

UMSIC - Usability of Music for the Social Inclusion of Children

Project aim and objectives

The overarching aim of The Usability of Music for the Social Inclusion of Children (UMSIC) project (2008-2011) was to develop a mobile time- and place-independent system that provided an interactive environment for children, whilst also enabling them to communicate musically and informally with their peers. In particular, the underlying rationale for the project was that such system could address the needs of children under threat of marginalization in society. These include children with moderate learning difficulties (such as attention deficit hyperactivity disorders, ADHD) and those who are immigrant and growing up as part of a minority group in multicultural contexts.

In order to achieve this aim, the EC have provided funding for a sustained, three-year research project involving specialist teams in four European countries, working collaboratively in a collegial and interdisciplinary manner. As part of the research process, there has been a need for the research to (i) address technical solutions, such as in terms of middleware design and software orientation, the latter going through a significant number of development iterations in response to fieldwork trials and related critical laboratory-based evaluation; (ii) create linked software packages that were designed to appeal to both younger and older children, whilst also being both culture sensitive and culture free (in terms of accessibility); (iii) identify groups of potential target users from the immigrant and moderate learning difficulty populations and (iv) ensure that the overall design was pedagogically appropriate in terms of children's learning and development, both in musical terms and also in relation to their social and emotional development.

UMSIC implemented a music-oriented product JamMo – jamming mobile for children aged 3-12 at risk of marginalisation. The JamMo product uses middleware solutions that provide seamless connectivity and dynamic re-configurability for different scenarios; the scenarios (stand-alone, networked, ad-hoc and public) were designed to enhance social inclusion. A special emphasis was put on the user requirements, i.e. child-computer interaction as well as other usability issues. JamMo is an application, which provides sound synthesis, sampling, sequencing and touch-screen virtual musical instruments in an educative form for children in different age groups and learners with specific needs. JamMo provides children with a new means of pursuing musical creativity, social cohesion and emotional self-regulation, which may significantly enhance social inclusion. JamMo is also a novel research tool with which data of children's cognitive, emotional and social aspects of general and musical development have been obtained. JamMo can be characterized as being an innovation for it includes all the following features as a combination: *musical creativity, learning and development, social sharing and identity, and research.*

UMSIC Work performed September 2008 – August 2011

In first 12 months, the project focused on requirements elicitation and additionally provided specifications for UMSIC software architecture (middleware), its components and interactions between software components. Several joint WP1/2 meetings and workshops accomplished the transformation of user requirement into technical requirements and the creation of deliverables. In addition, state-of-the technical requirements for the middleware were collected.

The main achievements of the first year were the requirement elicitation, the middleware platform and the implementation plan of the middleware.

During the second period the objectives were to develop the ch-usability framework for the evaluation of mobile different space technology and to carry out an initial evaluation of the JamMo product range. In the annual review it was perceived by the reviewers that the UMSIC team were not especially targeting social inclusion nor specifically evaluating with children from the two target groups. As a result, from WP3, more explicit design for social games were included and usability and impact evaluation studies had more deliberately targeted the special focus social groups. In addition, a document on best published practice in designing interfaces for ADHD children were circulated. Since the first review, the project's overall work has been aimed towards reinforcing the promoting of inclusion of marginalized young people, immigrant children and children with ADHD. This especially concerned the WP4, which was about the social, pedagogical, cultural and technical design of JamMo music making. Account of these groups has also been high on the agenda for WP5 where there has been a need to design a valid research assessment methodology. In WP6 the JamMo product has been built with UMSIC middleware and resources.

The main achievements of the second period were JamMo Subsystems development and implementation, the early evaluation of JamMo, and the mid way evaluation of JamMo.

WP7 and WP9 started during the third period. In WP7 the work aimed to validate the product by testing it and by building the product documents. The product testing and impact analysing were conducted by several fieldwork in England, Finland and Germany. Overall, the project has promoted open and easy-to-access solution in developing the JamMo 3-6 and JamMo 7-12 composing and singing products for children. The construction process has followed an open source software development model for rapid progress and external add-on functionalities. A public web site (http://jammo.garage.maemo.org/) with supporting tools for communication and distributed work has been established and actively used. This has been the main distribution until the web pages where the JamMo application is introduced to potential users, secondary users, and contributors were created. During the final year the development of the User Manuals of JamMo 3-6 and JamMo 7-12 for teachers and parents were created within JamMo Open Source Project http://www.umsic.org/jammo/. The final JamMo prototype was released June 2011.

In the project one main concern has been to identify what is meant by social inclusion in this context and to design applications and systems that support inclusion, reduce marginalisation and assist in learning.

During the three periods all the expected deliverables and milestones were achieved.

The final results and their potential impact and use

There is a range of complementary positive evidence from the fieldwork in England, Finland and Germany. This suggests that the UMSIC project demonstrates a 'proof of concept' concerning its research focus, namely that mobile music technology, in the guise of ***JamMo*, is capable of enhancing participants' sense of social inclusion as well as supporting individual and collective musical development**. The data from the school-based trials suggest that **the ubiquity of such devices can provide the basis for a 'community of practice' to supply additional informal network support for the individual learner**. Children were engaged with the device, even in the early fieldwork where the phone's intended functioning was unreliable, because its underlying conception was valid. **Key to the success**, apart from having the attraction of a modern mobile phone as the learning vehicle, **was the software design**.

Mobile technology is usually networked – it can be in 'stand alone' mode, but it is often linked to other media, implying a wide potential diversity of access and communication for the individual. This was demonstrated in the fieldwork where, in the final stages, the software designers **enabled a network function** for participants to share musical creation on the same phone. Teachers in both Finland and England reported that **the software appears to be broadly appropriate for UMSIC's two prime target groups,** i.e., recently immigrant children and children with ADHD. According to the teachers, children in both countries demonstrated **high levels of motivation to use *JamMo*.** The participating pupils remained **overwhelming enthusiastic about *JamMo* and its potential musical opportunities.** Teachers regarded *JamMo* as **a useful teaching tool** and the **software's provision of different levels in the pedagogical design was reported as a positive feature**. In the impact analysis study, **statistically significant links were found between the regularity of group music-making and singing activities and the participants' feelings of social inclusion.**

At this stage, it is only possible to report observed short-term impacts on those who have actually participated in the design and use of JamMo, namely the 345 children, aged between three and eleven years, who have been part of the UMSIC fieldwork in England, Finland and Germany over the past year from July 2010. Altogether, **during the project whole lifetime, over 1,400 children were involved.**

Positive benefits have been observed by each of the national teams in terms of **(i) children's social behaviours and sense of inclusion**; **(ii) language use in a musical contex**t; and **(iii) children's music making and learning**. There is sufficient evidence to indicate that ***JamMo* works** and **has met its original research aim**, namely to develop a mobile time- and place-independent system that provided an interactive environment for children, whilst also enabling them to communicate musically and informally with their peers. We recognise that **longer term development is needed**, both in terms of software refinement and extension, as well as the transfer of the JamMo software to more versatile mobile platforms to exploit the latest interfaces offered by the latest and next generations of mobile technology. However, the groundwork has been laid.

Ethics

During the project lifetime careful attention has been paid to establishing informed consent from young people and those with disability. The resulting system was designed to be accessible for all those targeted and represented in the participation groups. An Ethics checklist has been in use created by the Ethical Advisory Board to monitor the project work. This list has been followed in all work with children during the project lifetime. Ethics has been periodically reported. Final Ethics Report shows how the identified problems have been resolved.

Conclusion

At the final stage, the UMSIC project is delivering its original expectations. A full impact analysis has been carried out (shown in WP9) with use of one or more of the four prototypes that are being planned; these being the stand alone JamMo product for young children, the pair game JamMo product for young children, the JamMo product with orientation games for older children (intended for use in schools) and the JamMo community package (for children aged 10+) that will be situated in the home. The UMSIC project is now able to report on:

1. Children's engagement with the product;
2. Children's sociality with the product;
3. Children's music knowledge and ability with the product.

Finally the UMSIC project has: (a) provided significant new knowledge on methods; (b) evaluated handheld portable devices in the field; (c) assessed the impact of these devices and systems on children's sociability and knowledge and (d) on how to design and create such products in an Open Source multiplatform environment whilst working with a multidisciplinary team.

Project information

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