MOBILE TECHNOLOGIES AND EDUCATION

A Case Study at the Pori Art Museum

Heikki Haaparanta and Harri Ketamo

Tampere University of Technology, Pori, Finland

Abstract: The objective of this study was to explore new and mobile collaboration technologies and to try to find more effective ways for museum visits with mobile technologies. The study was implemented in December 2002 with 20 Finnish high school students. The students were participating in alternative art course. All of the students seemed to learn quite easily the technologies and methods used in this study but still there was a lack of time in every lesson. This leads us to few important conclusions: When the new technology is used with new students and in new environments, it is necessary the reserve enough time for students to get familiar with new technology and new teaching arrangements.

Key words: Mobile learning, Mobile platforms, Collaborative learning, Multimedia, Non-formal learning

1. INTRODUCTION

This paper describes one experiment with the use of mobile devices in education conducted by the Tampere University of Technology. It describes the technologies, methods and arrangements that were used in the experiment. The paper offers an example of how mobile devices can be used in the future in education. The paper also gives a short overview about similar and ongoing cultural technology research in Europe.

The European Union's Fifth Framework Program has funded several projects that combine culture and technology. Perhaps the one most closely aligned to our research is the COINE project (COINE, 2002). The objective of the COINE project is to develop interactive service for museums and other cultural producers and repositories. Its main aim is to create a service whereby a user may create a narrative story while visiting the museum.

The COINE project differs from the study described in this paper particularly in terms of the use of mobile technologies and from the collaborative aspects that the Pori study has.

There have been several projects in the European Union which have explored the potential of web-based cultural content production and delivery — for example CHIMER (2001), CIIPHER (2003) and PULMAN (2003). The main point of these projects lies in the quality of virtually produced content. As with this study, these projects have not focused on personal and social experiences what is able to get from culture.

- The objective of the CHIMER project is to improve the accessibility of cultural services, especially for children. Its goal is to combine and integrate different technologies (Internet, GPS, GPRS, WI-FI, GIS) so that any multimedia content developments can be delivered by means of the 3G network.
- The objective of the CIPHER project is to find different and innovative methods for the dissemination of cultural information at regional, national and global levels. The project is based in four culture forums that are producing and developing web-based information about their activities.
- The main purpose of the PULMAN project is to establish a network of museums and libraries that implement and provide the best practices of digital information presentation and production processes.
- The ACTIVATE project (2001) aims to find different models that can improve the quality of the processes by which local history and culture are documented. Its main target is to develop technological documentation that would help to improve the profile of rural areas in cultural tourism.

2. OBJECTIVES AND METHOD

The objective of this study was to explore new and mobile collaboration technologies, and to try to find more effective ways to use mobile technologies for museum visits. The study was implemented in December 2002 with 20 Finnish high school students who were participating in an alternative art course.

The students worked for a total of eight hours. The first two-hour lesson was held in their own school. The main target of this lesson was to paint a self-portrait and to convert it into a digital format. The students first painted their portraits and then photographed them with a digital camera.

In a second lesson, the students worked with computers for two hours in the xTask learning environment. In this time, the students became familiar

with its use and possibilities. The purpose of the lesson was for the students to gain familiarity with the xTask virtual learning environment, which was developed for the course. Then they used the computer to write a personal work plan for the course. The work plans were saved in each student's personal folder in the xTask environment.

The third lesson consisted of two hours at the Pori art museum during which time they would explore the use of mobile technologies. The students were provided with mobile devices that they were meant to use during their museum visit. Four of the mobile devices were Compaq iPaq PDA devices. These PDA's allowed the students to make both audio and text notes about the pieces on display in the art museum. Two of the mobile devices were built especially to record video and sound notes. These two devices were built from a Fujitsu Lifebook laptop linked to a microphone and a web-cam. With all of these devices the students were able to make a number of different notes in different media formats, and were able to send them directly to their personal folder in the xTask environment.

In a fourth lesson they spent a further two hours using computers to organize the notes they had taken in the museum and save them in xTask so that other students were able to see them and comment on them.

Traditionally, web-based collaboration uses text-based tools. However, text isn't always the best way, or the optimal form, to make notes. Sometimes a quick thought or an idea needs to be documented immediately. Still, there are situations where traditional text is a more suitable way to make notes. Mobile devices and new mobile technologies offer new possibilities for creating different kinds of notes. The Pori experiment tried to combine the use of speech and video notes with traditional text notes.

Because working in teams is more difficult when you are working with a computer, the notes should be able to be recorded in situ — in places where people are actually collaborating. In this case it meant that the notes should be recorded in museum as the students were observing the art works. That is why mobility and mobile devices are necessary to perform this kind of study.

3. TECHNOLOGIES, TOOLS AND RESULTS

The xTask learning environment that was used in this study is platform adaptive software. This means that the user is able to work with normal computers, PDA devices and hybrid platforms such as the Nokia Communicator. It also supports the use of sound, picture and video formats so that the user is able to use various media types and formats to provide notes and comments. The most relevant benefit from the use of xTask in this

study was that the same personal working environment was available both in museum and while working with the computers. The xTask server was located in the Tampere University of Technology, and could be accessed through Internet. In the Pori Art Museum there was a WLAN network, build over museum's existing network (Figure 1).

Figure 1. The WLAN in the Pori Art Museum

In the museum students were able to use two kinds of devices. One type of devices was Compaq Ipaq PDAs (figure2). With them students could construct audio and text based notes and send them to xTask server.

Figure 2. Compaq iPaq PDA device. Constructing an audio note.

Other type of device was video-platform (figure 3). Video platform was build over small laptop computer (Fujitsu Lifebook B-serie) extended with web-cam and microphone. Naturally audio and text based notes could be created with this platform as well.

Figure 3. Constructing a video note with a Fujitsu laptop and a web cam.

Students could use both types of devices, but only one at the time. The audio notes were the most popular way to construct notes. That was not a surprise, but the lack of good video notes was. It seems that constructing a video note requires more skill and time than an audio note. Text-based notes were not used when it was possible to make audio or video notes.

4. CONCLUSIONS

Generally the students were enthusiastic and seemed highly motivated about their work. This was particularly evident when the students were working with the mobile devices in the Pori art museum. There were probably several factors that increased the students' motivation.

- First, this was an alternative course that students had selected for themselves, so they were presumably already interested in work with art.
- Secondly, three of four lessons were held outside of the normal classroom; a previous study has shown that all actions that happen outside of the normal working environment increase students' motivation.
- Also, the work with new technologies, and especially with mobile devices, increases their working motivation.

- Students who took part in this study did not have any previous experience with the use of similar technologies, and so their motivation is presumed to be higher.

All of the students seemed to have little difficulty in learning the technologies and methods used in this study. Still, there was a lack of time in every lesson. This leads us to few important conclusions:

- When new technology is used with new students and in new environments, it is necessary to reserve enough time for the students to become familiar with the new technology and new teaching arrangement.
- While students are collaborating, they don't do the task all of the time.
- The major part of the time goes when students explore and play with new devices and environments.
- It is always possible that techniques do not work in a way that was planned.

While there have been similar, previous studies, that combine technology and culture, this study is different in its use of mobile technology in a virtual collaborative environment. The main focus for future research and development should be on supporting the use of mobile devices and collaborative group learning. This might lead us to developing non-formal learning that is place or time independent.

It is also potentially useful to explore the combination of still picture (photographic) notes and voice notes. A possible technology platform for this is Multimedia Messaging (MMS), which provides an excellent technical platform for the transfer of voice notes and still picture notes.

5. REFERENCES

- Activate. (2001). *ACTIVATE Project homepage*. Available <http://www.activate.ie/>
- Brophy, P. (2002). *COINE - Cultural Objects in Networked Environments*. Available <http://www.cultivate-int.org/issue7/coine/>
- CIPHER. (2003). *CIPHER – Communities of Interest Promoting Heritage of European Region project homepage*. Available <http://www.cipherweb.org>
- Chimer. (2001) *CHIMER Project homepage*. Available <http://www.chimer.org/>
- COINE. (2002). *COINE Project homepage*. Available <http://www.uoc.edu/in3/coine/>
- Davis, R. (2002). *PULMAN: rolling on by night and day*. Available <http://www.cultivate-int.org/issue7/pulman/>
- Kelly, A. & Clery, C. (2002). *Activate: New Access And Services For Cultural Content*. Available <http://www.cultivate-int.org/issue6/activate/>
- Ketamo, H. (2002). *User and Platform Adaptation in Web-based Learning Environments*. Doctoral thesis, Tampere University of Technology, Tampere, Finland.
- Mulholland, P., Zdrahal, Z. & Collins, T. (2002) *CIPHER: Enabling Communities of Interest to Promote Heritage of European Regions*. <http://www.cultivate-int.org/issue8/cipher/>

- PULMAN. (2003). *PULMAN – Public Libraries Mobilising Advanced Networks project homepage*. Available <http://www.pulmanweb.org/>
- Weiss, D. (2002). *CHIMER: Children's Heritage Interactive Models for Evolving Repositories*. Available <http://www.cultivate-int.org/issue8/chimer/>

BIOGRAPHY

Heikki Haaparanta has research interests in the use of technology in education. Recent research has focused on use of technology in the curriculum and the possibilities of digital and mobile portfolios.

Harri Ketamo has research interests in educational technologies and user modelling. Recent research has focused on adaptive studying environments and developing network based observation methods and tools.