bilearn
IST-2001-37187
the wings of learning

The Newsletter of the MOBilearn Project

Issue Six
January 2005

MOBIlearn is a worldwide European-led research and development project exploring context-sensitive approaches to informal, problem-based and workplace learning by using mobile technologies. The MOBIlearn project

consortium involves 24 partners from Europe, Israel, Switzerland, USA and Australia. Their competencies are integrated and extended by a Special Interest Group which includes more than 250 of the World's leading organisations, active in Information Technology.

Mobility, Mobile Learning and Future Markets

According to Maria Cristina Brugnoli of Telecom Italia Learning Services, technological trends strongly favour the spread of mobile learning. However, at the moment the current offering of mobile learning services is extremely weak. While the major players in conventional e-learning technology are offering a broad range of "mobile platforms" actual deployment of mobile learning services is still at an experimental stage and is largely restricted to services funded by European research projects.

"Technological trends strongly favour the spread of mobile learning"

But what's next?

To understand this the MOBilearn project has carried out a market study to identify a number of important socio-economic and technological trends of relevance to future mobility and mobile learning services. This has resulted in two studies the "MOBilearn Business Model" and the "MOBilearn Market Study", led by the Research and Development Department of Telecom Italia Learning Services.

The studies consider that the future of the market for mobile learning will depend, to a large extent, on the future of "mobility" and of the different kinds of mobility. Will mobility continue to increase in the future as it has done so in the past? Will it be true for all kinds of mobility? What kinds of mobility are likely to prevail in the future? And what do they mean in terms of demand for new services? What are likely to be effects on the market for mobile learning? These are some of the questions that these studies have tried to answer.

Main outcomes

Firstly, in the medium term (3-10 years) it was concluded that increased fuel prices and global political instability could halt, or at least slow down, this trend towards increased mobility that has been continuing since the Industrial Revolution. This tendency is likely to have negative repercussions for the tourist industry and for business and academic travel – sectors of key importance for mobile learning.

However, micro-mobility, for example, on campuses, within offices, and in hospitals will be unaffected by these trends. Support for this kind of micro-mobility is likely to be a key source of demand for mobile learning services.

In the longer run, it is expected that there will be a gradual increase in the demand for teleworkers and mobile workers. These workers will be an important market for future mobile learning services.

Continued on Page 2

Further information on the MOBilearn Project and the Special Interest Group contact : -

Giorgio Da Bormida
MOBIlearn coordinator
GIUNTI Ricerca. Italy.
Email: g.dabormida@giuntilabs.com
Tel: +393356517013 (mobile)
or +39018542123
Fax: +39018543347

This newsletter has been edited and published by pjb Associates. If you have any comments contact Peter Bates
Email: pjb@pjb.co.uk

MOBIlearn is a 30-month, 8 Meuro, project co-funded by the European Commission (DG INFSO, D/3-Education and Training), within the IST programme of FP5. US and AU partners are hoping to be funded by US National Science Foundation and AU Department of Education, Science and Training.

Continued from Page 1

Technological trends also strongly favour the spread of mobile learning. The explosive success of mobile telephony, that has been especially strong on European markets, creates a massive potential user base. The gradual replacement of current generation mobile telephones with "converged devices" will provide this user base with the kind of devices they need to effectively access mobile learning services. The rapid spread of Wi-Fi technology and the prospect of even more powerful WLAN technologies in the near future will lead to rapidly falling telecommunications costs, eliminating the last major technological obstacle to the uptake of mobile learning services.

"rapid spread of Wi-Fi technology will lead to rapidly falling telecommunications costs, eliminating the last major technological obstacle to the uptake of mobile learning services"

Mobile learning is already an important market for PDAs (personal digital assistants), especially in the USA, and is likely to generate significant demand for the next generation of "converged devices". This implies that device manufacturers could play an important role in promoting the new services.

However, mobile learning requires low cost telecommunications that are likely to be based on Wi-Fi networks installed in campuses and offices than on operator-managed services such as three generation - UMTS. At the same time, however, the success of mobile learning will depend to a significant extent on synergies with non-learning services like logon services, navigation services, payment services - many of which are likely to be provided by telecommunications. This means that mobile learning content service providers need to work closely with the mobile telecom operators.

For more information contact Maria Cristina Brugnoli, Telecom Italia Learning Services S.p.A. Email UE001864@guest.telecomitalia.it

An extensive activity-based review of mobile technologies and learning

Researchers at the University of Birmingham have been commissioned by UK-based NESTA Futurelab to produce an extensive activity-based review of mobile technologies and learning. Rather than the curriculum-focused approach of previous reviews, this review seeks to identify the types of learning activities that mobile technology can both support and enable.

A selection of prominent case studies from around the world is used to illustrate the following theory-based categories of activity:

Behaviourist - activities that promote learning as a change in learners' observable actions.
Constructivist - activities in which learners actively construct new ideas or concepts based on both their previous and current knowledge.
Situated - activities that promote learning within an authentic context and culture.
Collaborative - activities that promote learning through social interaction.
Informal and lifelong - activities that support learning outside a dedicated learning environment and formal curriculum.
Learning and teaching support - activities that assist in the coordination of learners and resources for learning activities.

The most successful and engaging activities draw on a number of theories and practices, indicating a need for a blended approach to enabling learning with mobile technologies.

As learning and teaching with mobile technologies breaks through from small-scale pilots to institution-wide implementation, educators and technology developers must consider the issues of context, mobility, learning over time, informality and ownership. The research informed guidelines identified through the MOBilearn Project can help to address these issues along with more practical concerns such as cost, usability, technical and institutional support.

"mobile technologies are becoming more embedded, ubiquitous and networked, with enhanced capabilities for rich social interactions, context awareness and Internet connectivity"

Mobile technologies are becoming more embedded, ubiquitous and networked, with enhanced capabilities for rich social interactions, context awareness and Internet connectivity. Such technologies can have a great impact on learning. Learning will move more and more outside of the classroom and into the learner's environments, both real and virtual, thus becoming more situated, personal, collaborative and lifelong. The challenge for mobile technologies will be to transform learning into a seamless part of daily life to the point where it is not recognised as learning at all.

The review will be available for download at http://www.nestafuturelab.org/research/lit_reviews.htm in January 2005.

Towards a Task Model for Mobile Learning

This article is based on a paper by Josie Taylor, Mike Sharples, Claire O'Malley, Giasemi Vavoula, Jenny Waycott. It describes how a task focused model for mobile learning has been developed in order to better understand the interactions between learners on the move and the tools that they may use to assist them in their learning.

Over the past five years there has been a rapid growth in research, development and deployment of mobile technologies to support learning. Research began in the mid 1990s at Xerox PARC with the work of Kay and colleagues, but only recently have both technology and educational needs converged.

The new emphasis in education is on supporting the learner, in collaboration with peers and teachers, through a lifetime of education, both within and outside the classroom. There is a natural alliance between learning as a lifelong activity and personal mobile technology, so that it is becoming feasible to equip learners with powerful tools to support their learning in many contexts over long periods of time.

This new area of personal mobile learning is distinctively different from learning within schools and colleges, and from the traditional notion of continuing education, with its emphasis on equipping people with the skills and knowledge for a rapidly changing society. It has also brought about a need to re-conceptualise the interaction between learning and design of mobile technology.

Socio-cognitive Engineering Design Process

MOBilearn has adopted the socio-cognitive engineering design process developed by Mike Sharples the University of Birmingham, UK. The process begins by specifying the general requirements and constraints for the system to be designed. This sets out the type of activities to be supported by the new technology (such as learning and knowledge management), the general domain (such as learning in a museum) and any general constraints (such as time and budget available for the system design).

This leads to two parallel studies, an investigation into how the activities are performed in their normal contexts, and a more theory-based study of the underlying cognitive and social processes. The outcomes of these two studies are synthesised into a task model.

Task model

The aim of the task model is to provide a coherent account of how the activities are performed, the people involved, their contexts, the tools and technologies they employ, the structure of the tasks and an account of their cognitive processes, management of knowledge and social interactions.

From the analysis of the studies, a central concept of mobile learning is articulated:

> "There is a clear separation between ***functionalities*** and their ***embodiment*** in any specific technology."

In other words, in a work situation or a learning situation, people know what kinds of functionalities (tools) they would like around them to be effective, and will seek these out as and when they need them.

The view of mobile learning expressed by other authors is also re-iterated:

> "It is the ***people*** that are defined as 'mobile', not the devices around them."

That is to say, mobile learning is not defined as learning taking place by means of a mobile device. Instead, it is learning that takes place when someone is on the move, and it may be undertaken through a variety of devices, only some of which would be described as inherently 'mobile'. But, it is the interaction of learners and the technology in a mobile setting is of interest.

Continued on Page 4

"there is a clear separation between functionalities and their embodiment in any specific technology"

"it is the people that are defined as 'mobile', not the devices around them"

Continued from Page 3

So the main purpose of the task model is exactly to describe the interactions between the people and their tools and resources, and to analyse how people externalise their work, through representations such as notes and diagrams, the rules and conventions that influence the activity, and the terminology and patterns of discourse.

The task model provides the bridge to a cycle of iterative design that includes: specifying a design concept; generating a space of possible system designs; specifying the functional and non-functional aspects of the system; implementing and deploying the system. Testing is an integral part of the design process, with the results of the evaluation being fed forwards to provide an understanding of how to deploy and implement the system, and backwards to assist in fixing bugs and improving the design choices.

The task model is based on a modified version of Engestrom's extended activity model, and provides a mapping between the technological domain and the more human-oriented social domain.

"task model has been used to capture the myriad possible interactions that learners may engage in as they roam around their respective environments"

The relationship between these two domains is dialectical, which means that they affect one another. Changes in the technological domain have consequences in the human domain, and vice versa.

In the MOBIlearn project, this model has been used to capture the myriad possible interactions that learners may engage in as they roam around their respective environments, picking up and using devices as they go. Each of the three scenarios can be mapped onto the model, instantiating each of the nodes, and encapsulating the learners, their objectives, their context and their tasks.

Structure can be provided to an enormously complex learning situation, which, from a design point of view, would otherwise be very difficult to tackle. Although this work is in its early stages, the model is being evaluated and tested against ongoing field studies in the MOBIlearn project.

For further information contract Josie Taylor,
The Open University, UK
Email: J.Taylor@open.ac.uk

mLearn 2005
Mobile technology: The future of learning in your hands

"mLearn 2005 Cape Town, South Africa - 25 to 28 October 2005"

The fourth mLearn 2005 international mobile learning conference will take place from 25 to 28 October 2005, in Cape Town South Africa. So far, previous mLearn conferences have attracted large number of participants from more than 60 countries representing all continents, and is, therefore, the world's largest international conference on m-learning and emerging ambient technologies.

This year's conference will fulfil the need for stimulating critical debate on and research into theories, approaches, principles and applications of m-learning. It will provide an opportunity for professionals and practitioners to share their knowledge, experience and research in the various areas where m-learning is applied. The conference will also serve as an incubator to promote m-learning in Africa. The objectives for the conference are to:

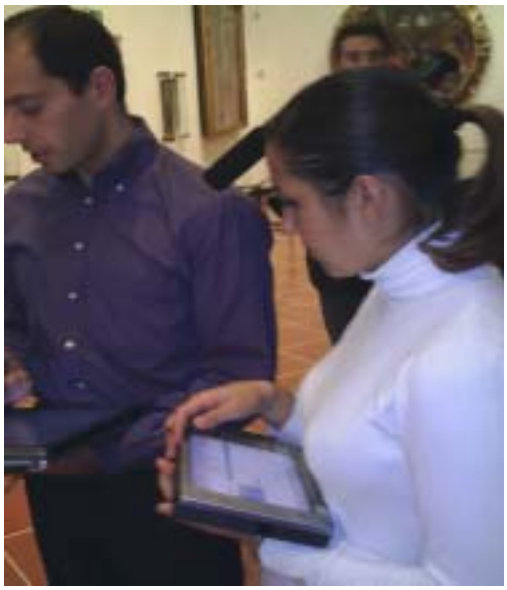
Promote the development of m-learning, globally, but especially in developing countries.

Stimulate critical debate on and research into theories, approaches, principles and applications of m-learning.
Share local and international developments, experiences and lessons learned.
Promote networking and business opportunity development.
Encourage the study and implementation of mobile applications in teaching and learning.
Stimulate and assist personal professional development and the development of new skills for educators.
Provide a forum for education and knowledge transfer.
Facilitate dialogue, sharing and networking between diverse cultures with regard to the optimum use of emerging technologies.

Submissions of papers need to be made before the 11 March 2005. For further details regarding presentation categories, submission guidelines and registration fees are available online at:
http://www.mLearn.org.za or
Email: info@mlearn.org.za

MOBIlearn User Trial at the Uffizi Gallery

By
Claudia Alborghetti and Elena Murelli
CRATOS - Università Cattolica
del Sacro Cuore, Piacenza Italy



On 6th December 2004 a unique experience involving foreign students, passionate art experts and a restoration school took place in the breathtaking background of the Uffizi Gallery in Florence. Picture this: a whole day spent alone (the Gallery is closed to tourists on Monday) in two of the most visited and admired rooms of the Gallery, Botticelli's and Leonardo's, with a PDA, a tablet PC or a cell phone at hand. Art lovers would scream "Technology in the temple of beauty and silence? Never!" but in this case, for one day at least, even art had to give way to the latest innovation in the field of guided visits in museums.

The MOBIlearn Project tested the museum scenario with real and unaware users who were asked to visit the Botticelli and Leonardo's rooms by looking for information on the paintings directly using the MOBIlearn application.

The first group, composed of foreign students from the Middlebury College in Florence entered the museum tickled by curiosity. Only one was interested in art and had a broad knowledge of the subject,

After a brief introduction to the Project, by the coordinator Giorgio Da Bormida, the students had to fill in a pre-questionnaire that outlined their knowledge in art and technology. As the trial began, they were asked to create their personal profile for the system and then they were ready to gather information on the paintings, chat with other people in the room, send messages and take notes as though they were visiting the museum like normal tourists.

The trial was a real challenge for all students, who found their way through the labyrinth of technology and art for almost an hour. It must be pointed out though that almost all of them appreciated the idea of this new system. They helped the researchers understand the flaws and difficulties encountered during the test and gave a positive overall score to the experience, as their post-questionnaires indicated.

"project tested the museum scenario with real and unaware users in the Botticelli and Leonardo's rooms"

Continued on Page 6

Continued from Page 5

The second group, composed of art experts from the association “Amici degli Uffizi” (Friends of the Uffizi), were given PDAs to trial the system. After the pre-questionnaire, they were free to roam using the application at their will and choose their path among the different options available in the museum scenario. One of them in particular was an expert both in art and technology and helped the researchers understand step by step the obstacles that even someone like him could encounter on his way through the visit.

“art experts from the association “Amici degli Uffizi” (Friends of the Uffizi), were given PDAs to test the system”

Adult visitors though, proved to be more critical on the system, but after an extensive analysis of all areas they were more than happy to encourage the development of this system in a museum.

The third group came from the School of Restoration in Florence and all students were familiar with art and the Uffizi Gallery. The pre-questionnaires also showed how competent these users were with the devices they were to use during the trial. This was noted by the researchers as they distributed mobile phones, PDAs and tablet PCs.

As already verified in the previous trials, the devices that proved to be the most difficult to use were the mobile phones and PDAs Even the most curious users felt disappointed whilst desperately trying to retrieve information from the system. This particular situation led people to focus more on the paintings in the room than on the system itself and preferred to follow the path of the tourist that observes art with awe and respect. However, the overall impression on the system, even in these cases, was good and students felt satisfied with the experience and learned something more about well-known paintings like the Allegory of Spring by Botticelli.

Three groups and a total of 28 participants shared their impressions and, in some cases, their difficulties with technology when applied to an experience like a visit to a museum. The strongest points that users identified were the pleasant interface of the system, the information was interesting and comprehensive and the chat option was good. In general all were excited about the idea of introducing this system in the museum. Nonetheless, there are some obstacles to overcome. Some users found it hard to access the content, others could not retrieve the information they were looking for and when they did, the content itself was confusing at times. However, it was interesting to see how people felt spurred to help each other when it comes to using technology. Students were ready to interact with each other and lend a hand to those who felt ill at ease with portable devices.

In conclusion, the test was successful for those aspects concerning the research and development of the MOBIlearn system, whereas the negative aspects focused on technical difficulties that can be discovered only after a first test by real users. In any case, this trial proved useful for the researchers involved and

interesting or innovative for the people who agreed to participate in such a rare event: the MOBIlearn user trial successfully mingled art and technology for one day.

For more information contact Elena Murelli Email: elena.murelli@unicatt.it