



Innovations Workshops

Future phones: mobile, connected and interacting learners?

An Insight Paper

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"...for teenagers who are struggling with their identity and social status. Phone usage does not only increase the opportunity to bond with friends and to organise a social life on the move and privately, it also provides a symbol for acceptance. This is important to a teenager's individuality and confidence."

Childalart 2005

The depiction of the learner as mobile; as always having the ability to connect to peers, experts and resources and as being in control of a personal and powerful tool for learning, is one which pictures an empowered, autonomous learner with great potential for involvement in rich learning experiences. For 3G phones to really empower learners, an investigation needs to be undertaken into the potential applications and contexts of use for this technology.

Technically, 3G phones are described as mobile devices that have the capability to transmit multimedia data wirelessly up to two megabits per second. Socially, 3G phones are defined by their cultural importance to the user, as personal, always-on tools whose use is embedded within social practices and the development and representation of 'self'. Technical barriers are constantly pushing towards the 3G phone as a mobile media centre. In doing so, social, temporal, distance and physical barriers are all pushed to create new opportunities for meaningful interactions between disparate communities.

The Futurelab Innovations Workshops series aims to help pioneer new ways of designing and using ICT to enrich and transform the learning experience by creating a space that brings together experts from the creative, education and technology communities to explore emerging issues of importance in the field. This Insight Paper aims to highlight some key issues in young people's learning as well as recent technological developments and innovations in the field of 3G phones. By bringing together these issues, this Insight Paper is intended to provide the beginnings of a shared understanding between the participants at the Innovations Workshop, and by doing so, to stimulate discussion and creative thinking into how third generation mobile phones can be best developed and used to support and enrich learning experiences in 5, 10 and 15 years' time.

1. VIDEO-SUPPORTED LEARNING AND TEACHING

A key focus for this Innovations Workshop is an investigation into the role of high quality, mobile video. Video is already regarded as a key tool in distance learning and e-learning, providing a transmission of content for learners to observe. Support for non-present learners comes through the benefits of observing an expert, of witnessing multimedia narratives and having the ability to re-watch content in relation to personal comprehension. This process can be far from a passive experience (Bates 2003) and in addition to this the video supported by 3G phones can also be interactive, providing the opportunity for broadcast, transmission and interactive video-conferencing. Developing the affordances of broadcast, interactive video-conferencing can have a positive effect upon learning through developing positive attitudes to learning and enabling faster access to resources (Bosco 1986, Fletcher 1990, Stanfford 1990). Within this communication, users have the opportunity to observe intonation and expression of the caller in a way that changes the dynamic of the traditional phonecall. This can be developed further through the use of emerging technologies such NIAD's **mobile video-conferencing** (www.niad.co.uk) that enables video calls from a mobile phone to a desktop computer. The ability to report from location to classroom, from an experiment in the science lab to the students in the library, or from the sports field to the music studios becomes possible.

Video has often been cited as an appropriate tool for teachers to use to develop reflective practice, to enrich 'professional vision' (Goodwin 1994) and to improve professional practice.

The Teacher Training Agency (TTA) highlights its use within subject teaching (in this case 'thinking skills'):

"Video is an essential part of the coaching cycle, which has been developed in order to help teachers improve their performance in Thinking Skills, as it allows specific aspects of a lesson to be highlighted and analysed in isolation, for example the de-briefing process, or post-activity discussion."

Video can be seen then as a tool for developing reflection, encouraging discussion and improving future practice amongst teachers and learners, and leads to the questions as to whether this can also be applied to younger learners.

In addition to the direct affordances of video, Hicks (1997) highlights other benefits of interactive multimedia such as:

- **flexibility** - variety of location, time, frees teachers to focus upon other interactions
- **practical** - allowing learners to progress through the process of learning by seeing, to learning by doing, to learning by creating - based upon a strong understanding of the task
- **timely** - information and interactions appropriate to the need of the learner and at the time most appropriate to the learner
- **engaging** - the provision of video, audio, graphics, feedback, expert advice, questions and answers can provide engaging rich experiences.

Recent software innovation and technical developments have sought to develop the affordances of video to create further possible benefits and uses.

Requestec (www.requestec.com/contactus.html) allows multi-party video-conferencing between three mobile participants and a central PC-based moderator (who acts as controller of the conversation). This develops the scenarios suggested above to create more opportunity for multi-partner collaborative working. Whilst the role of PC moderator is important to consider within the development of a learning context that takes advantage of this technology, the possibilities offered by centrally connected mobile learners presents new and exciting challenges for educationalists.

MxTelecom (www.mxtelecom.com/uk/index.jsp?m=video#ivr) software can stream live video content directly to 3G handsets. However, the connectivity of the 3G phone allows the user to take on a role of director by selecting particular cameras and angles to watch the video. An example provided on the website is of the user choosing particular camera angles within a 'Big Brother'-type reality show, but this is developed with the possibility of overlaying the video stream with data personal to the user, for example, particular questions or comments from peers or teachers.

An example of developing use of video could be seen through advancing the current trend of blogging (capturing still images and text and publishing directly to the web), by combining moblogging (mobile blogging) and vlogging (video blogging). Learners have access to a tool that enables them to collect narratives of their experiences that they can share with specific audiences. By providing a clear audience and a real reason to capture such experiences, 3G phones may be used to capture developing process rather than performance and product. An early example of this is **OKlip** (www.oklip.com:8080/), a website that enables viewing and sharing of mobile phone video clips.

Although the screen size for viewing content varies between handsets, a Siemens prototype demonstrated at CeBIT 2005 aims to use any surface as a screen (and input method) by projecting the screen content onto a flat surface. With this development, viewing the mobile screen can become more easily shared between groups and an additional input method is available for the user.

(www.siemens.com/index.jsp?sdc_p=cz3su20o1255502pFEnflmi1188523&sdc_sid=9480990992&sdc_bc_path=1189122.s_0%2C&)

2. MOBILITY

3G phones enable learners to be highly mobile whilst still retaining access to video and other multimedia resources. Embellishing the affordances set out above then, how can mobility add to the learner's experience?

The Futurelab Literature Review 'Mobile Technologies and Learning' gives a comprehensive overview of this area and provides an insight into the pedagogic approaches underpinning the development of mobile learning contexts.

The Innovations Workshop provides the opportunity to explore particular aspects of designing mobile learning contexts. Particularly:

- distributed learners sharing experiences
- located learners providing separate views on shared activities
- disparate groups communicating a variety of collected data
- the role of experts within distributed communities of learners.

There are a variety of location/context sensitive technologies that can further develop the notion of the 'mobile learner'. Location-sensitive technologies (for example GPS, GPRS, InfraRed, Active Posters etc) can ensure that specific information/activities are presented that are relevant to the particular location of the learner. This can lead to the development of Perkin's notion of 'person plus' (Perkins 1997) towards 'person plus plus' as the environment can become more active and reactive in the distribution and development of knowledge.

Recent developments in location-based technologies that expand the opportunities provided by 3G phones include **Crunki** (www.crunkie.com/), software that positions the user's location on a map (displayed on their phone) as well as the location of friends. Media can be tagged to particular locations for sharing between social groups. **Tiny GPS** (www.psiloc.com/index.html?id=169) triggers events based upon the location of the phone. The events can be as wide-ranging as sending a text message to playing a video file.

A different approach to locative technologies can be seen in the use of 'visual hyperlinks'. For example, Hewlett-Packard's 'Active Posters' enable the user to take a photograph of a 'square bar code' that contains the URL to a website. The WAP browser then opens the specific web link, providing relevant information to the location, to the poster, whilst also collecting information about who has selected to download the information. **Neven Vision** (www.nevenvision.com/products/oR-ASP.html) provides a similar outcome but through sending an image to a central server that decodes the image and responds with appropriate information.

The potential of receiving multimedia information relevant to specific locations creates opportunities for varied interactions between learners. Different models of collaborative working can be used: technologies shared or individual, tasks shared, paralleled, competitive or divided, yet all linked by the commonality of an immediacy of feedback relevant to individual contexts.

3. SOCIAL TOOLS

Personal technologies that have strong communicative capabilities can provide exciting new opportunities for learners to share ideas and to begin to experience other people's views. This can enable communication between different social groups (eg young people and politicians) and between people from differing sides of a debate. This is partly due to 'social software'

that provides new methods of interaction for disparate/connected communities and brings to the fore an emphasis upon the notion of 'presence'. This workshop will investigate how the design of learning contexts can best employ the 'pulsating' distributed communities of learning that are enabled by 3G phones.

An example of recent innovation in social software is **Crowd surfer** (smallplanet.net/) which uses Bluetooth connection to locate friends within 80 feet of your location, then provides the opportunity to exchange photos and information with them. **Mobiluck** (www.mobiluck.co.uk/) uses Bluetooth to recognise any other Bluetooth-enabled device within 80 feet. Based upon the signal strength of each device the software shows the distance of the technology from you. The phone then matches the profile you create on your device with that of other phones around you, comparing your interests or requirements. It can then sound an alarm when you have a match. The issue of the type of information that can be exchanged and the data that is compared provides an interesting area of exploration for designers of learning contexts.

Displaying 'presence' (the availability or willingness to communicate) becomes very important when using socially connected tools. In using the software mentioned above, the data and information users are asked/prepared to display are outward signs of 'self', similar perhaps to the avatars used within computer games. **Skype** (www.skype.com/) displays the online status of friends on either phone or PC, using emoticons to show presence. Selecting a present friend then enables communicate through text and chat.

An interesting meeting between video calls and presence is the Neven Vision software (www.nevenvision.com/images/NVffTVideo.wmv) that allows users to control a 3D avatar in real-time using facial expressions within a live or recorded video stream. This could enable learners to display little presence whilst involved in video-conferencing.

4. PROJECTS

A variety of projects have taken place which investigate hand-held, mobile learning. However, relatively few have been undertaken in the UK that focus upon mobile phone technologies, rather than PDAs. Within this paper, projects have been identified that use mobile phones, yet much can be learnt from other mobile projects, (such as those identified in the Futurelab mobile literature review).

An overview of various projects is presented here to give examples of current thinking with the mLearn community. The Innovations Workshops will learn from these projects to describe various rich learning opportunities that are made possible by the appropriate use of 3G phones.

m-learning project (www.m-learning.org/)

A pan-European project focusing upon the commonality between students who had failed/been failed by the current education system. The common factor is their ownership of a mobile phone, a tool put to use during this project to support these young adults to become engaged in learning opportunities.

Text2Teach project (www.unescobkk.org/education/ict/v2/detail.asp?id=11184)

Central to this project is the ability for teachers, anywhere in the world, to select and receive digital educational programming – videos, pictures, text, or audio files – over mobile technology already in use in their community. The project aims to help improve the quality of teaching science through the provision of highly interactive easy-to-use multimedia packages designed to make science learning more exciting and meaningful among young learners.

eVIVA project (www.eviva.tv)

Investigating the role of mobile phones for assessment purposes, eVIVA enables KS3 ICT assessment to take place through a non-present viva. Students develop a multimedia e-portfolio including digital photos, videos and text which are gathered in line with their agreed milestones. During the viva, the student's voice is converted by special software into text which moderators then use to mark.

Mobile Author application (Virvou 2004)

This helps teachers create and author their computer-based courses. It allows teachers to insert domain data into the application (lessons, assessment tests etc). The data documents are HTML documents. Both students and the teacher have access to the databases of the application, and they communicate with each other via SMS, e-mail or the databases. All can be done via the mobile phone. Students can read their assignments, do their tests and send them to the teacher for him or her to check them. Throughout teachers stay informed of the progress of their students wherever they may be and whenever they want. Results show that the majority of teachers found the mobile facilities both useful and user-friendly.

5. HEALTH CONCERNS AND MOBILE PHONES

This section of the Insight Paper presents an overview of the issues regarding mobile phone use for young people and children. There is limited evidence to suggest the negative effects of mobile phone use and the overall tone set by Sir William Stewart is one of precaution. The workshop will investigate uses of mobile phones for various ages with the understanding that by looking at scenarios 5, 10 and 15 years into the future, more research and publications will be made about the medical effects of mobile phone use.

The Stewart Report, published in April 2000, was the result of a Government-commissioned investigation into the health issues concerning mobile phones. This report advised that gaps in our current knowledge mean we should take a "precautionary approach" to phone use. For adults this means using our phones for limited amounts of time. For children the advice was much stronger. The Stewart Report recommends that under-16s use their phones only for essential calls.

"If there are currently unrecognised adverse health effects from the use of mobile phones, children may be more vulnerable because of their developing nervous system, the greater absorption of energy in the tissues of the head (paragraph 4.37), and a longer lifetime of exposure. In line with our precautionary approach, we believe that the widespread use of mobile phones by children for non-essential calls should be discouraged. We also recommend that the mobile phone industry should refrain from promoting the use of mobile phones by children."

The Stewart Report: www.iegmp.org.uk/report/text.htm

In January of 2004 the National Radiological Board produced a new report which updated the original Stewart Report. Its conclusion was to maintain the precautionary approach.

"There is as yet no hard evidence of adverse health effects on the general public, but because of the current uncertainties we recommend a continued precautionary approach to the use of mobile phone technologies"

www.nrpb.org/publications/documents_of_nrpb/pdfs/doc_15_5.pdf

“All of these studies have yet to be replicated and are of varying quality but we can’t dismiss them out of hand,’ Sir William said. If there was a health risk — **which remained unproven** — it would have a greater effect on the young than on older people, he added. For children aged between 8 and 14, parents had to make their own judgments about the risks and benefits. ‘I can’t believe that for three to eight year-olds they can be readily justified,’ he said.”

The Times 12/01/2005

Further information can be found at www.hpa.org.uk

6. KEY QUESTIONS TO BE ADDRESSED DURING THE WORKSHOP

The workshop will interrogate and answer some key questions that are central to the development of 3G phones as a tool for learning by creating visions of future practice and designs for innovative projects.

Attendees are invited to consider the following questions in preparation for the workshop:

- How best can learning contexts be developed for pulsating networks of learning?
- What is the role of the classroom 'gathering' for mobile connected learners?
- How can notions of presence best be developed to encourage the development and representation of 'self'?
- How can 3G phones best support rich interactions between disparate social, economic and political communities?
- What opportunities are provided when the learner is empowered to produce, broadcast, create, direct and observe?
- How can mobile, high quality video best be used to enrich and transform learning experiences?

7. NUMERIC DATA

Percentage of the UK population with a mobile phone	75%
Percentage of UK young adults with a mobile phone	90%
Percentage of primary school children with a mobile	25%
Number of mobile games downloaded to phones per year	2 million
Number of under 16s in the UK who own a mobile phone	5 million
Number mobile phones worldwide by the end of 2006	2 billion
Number of SMS messages sent in the UK for 2005	30 billion

Information from the Mobile Data Association: www.mda-mobiledata.org

8. RECOMMENDED READING

Futurelab Literature Review: Mobile Technology and Learning.
www.futurelab.org.uk/research/lit_reviews.htm

Hicks, S (1997). Benefits of Interactive Courseware. [http-server.carleton.ca/~shick/mypage/benefit.html](http://server.carleton.ca/~shick/mypage/benefit.html)

Yerushalmy, M and Ben-Zaken, O (2004). Mobile Phones in Education: the Case for Mathematics. Haifa

Perkins, DN (1993). Person-plus: a distributed view of thinking and learning. In G Salomon (ed), Distributed Cognitions: Psychological and Educational Considerations (pp88-110). Cambridge: Cambridge University Press

Ulicsak, M (2003). Can Blogging be Used in Education? www.futurelab.org.uk/viewpoint/art21.htm

Williamson, B (2003). Hand-held Computers and Learning in Public Spaces
www.futurelab.org.uk/viewpoint/art19.htm