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Education in the Wild: contextual and location-based mobile learning in action

Authors and organiser: Elizabeth Brown & Michael Sharples (Learning Sciences Research Institute, University of Nottingham)

1. Scope of the workshop

The workshop explored recent innovations into location-based, or geospatially-informed, contextual mobile learning, and issues arising from them. Location-based technologies offer opportunities for new forms of learning that engage more deeply with physical surroundings and support continuity of understanding across settings; they also pose technical difficulties of modelling and maintaining continuity of context, and ethical challenges including the right to privacy of location and escape from continual monitoring.

The workshop brought together experts in mobile learning from educational and technical backgrounds, with newcomers (including PhD students) across Europe and North America. The goals of the workshop were threefold:

1. to share good practice of research innovations and case studies
2. to engage in debate and discussion of critical issues surrounding contextual and location-based mobile learning both currently and in the future
3. to conduct future-scanning activities in contextual and location-based learning

2. Actual schedule/procedure of the workshop; main events

The structure of the workshop was as follows (for detailed time schedule and the participant list see appendix 3):

Day 1: 2 Dec 09: Introduce and map the scope of 'Contextual and location-based learning'

An initial introductory talk was given, from the workshop proposers, presenting the need and scope of the field, and its basis in education theory and in technical developments, followed by group discussion.

Presentations of exemplar research projects from participants to indicate the spread and depth of current work in contextual and location-based learning. Each project was in the form of a structured session, where the contributors presented demonstrations of their systems and/or a video of a TEL intervention, along with a presentation of the educational aims of the project, its technical execution, and evaluation of usability and educational use. There was a mixture of mature projects and new work in progress.

Group discussions, addressing the question 'What is the educational problem that contextual and location-based mobile learning is trying to solve?' followed by a plenary discussion.

Day 2: 3 Dec 09: Explore opportunities, possibilities and issues for the future

A half day Future Technology Workshop (FTW, a structured workshop to 'design the future' of learning technology and activity) was carried out. Three teams with mixed education and technology expertise were set the challenge to design an innovative and educationally valuable contextual learning system of the future. The design process was captured in video and still images, as part of the FTW approach (including creation of designs, physical models, and educational scenarios) and the outcomes from each group resulted in an envisioning of technology and activity for future contextual learning.

A semi-formal debate was held, on an issue of concern in location-based technology. The issue was decided by participants during the workshop and the title was 'the delivery of contextual and location-based education results in shallower learning strategies'.

3. Results of the workshop

a) *What has been learned - especially in respect to the Grand Challenges 'Connecting learners', 'Orchestration' and 'Contextualisation'?*

Connecting learners: The workshop examined ways of connecting learning across formal and non-formal settings, such as carrying out work outdoors and later reflecting upon it in the classroom. We also discussed the opportunities for lifelong learning and the fact that mobile learning creates many opportunities for informal learning, such as that in the workplace or for learners who are on the move (on public transport, for example). In this way, mobile and location-based learning provides settings in which new paradigms of education can be explored. This could possibly mean the separation of 'schooling' (which seems to be assessment-driven) and 'education' (as a more holistic endeavour). We also talked about the role of learner preferences for context-based and classroom-based learning. Another aspect is the technological opportunities for connecting learners in location, such as augmented reality platforms (e.g. Layar; Wikitude) to bring together people and artefacts from their environment, and including contexts such as history as an additional aspect.

We also discussed the ethical implications of mobile learning, such as the inherent problems in being able to track users: this is a potentially more sinister aspect of 'connecting learners' and one that requires much more research. Are people happy to compromise on the availability/use of their private data if they are to benefit from this?

Orchestration: Internet users have changed from being mere receivers of web-based content to become that of 'prosumers' – both producers and consumers. The quantity of data generated each day by the general public is vast, leading to information overload and difficulties in managing such information. A key challenge will be the appropriate selection of information and the technologies that generate it, so that learners are provided with appropriate content generation and filtering mechanisms.

Contextualisation: Technology has changed dramatically in the last decade and GPS is now standard. Technologically, the world has changed, but we feel that the scientific questions haven't.

Context can be created through interaction between people, settings, and artefacts. A central issue is how to create micro-sites for learning. The environment can be an active agent and resource: we can learn **in** environments (seizing opportunities for learning), **through** the environment (employing aspects of the current surroundings to structure and enrich learning), and **about** the environment (in environmental studies and field trips).

However, we also need to look beyond just the physical environment and look at trajectories of context and how we enable transitions between contexts. In relation to the 'orchestration' theme, where we discussed information management, it is important to realise that data can change context and so it is also crucial to consider versioning and preservation of data.

b) *Which are some new questions and issues with respect to the Grand Challenges 'Connecting learners', 'Orchestration' and 'Contextualisation'?*

Connecting learners:

- As society becomes more consumer-driven, how can we support a growing divergence between formal and informal education? How can we address this conflict (if one exists)?

- How can we connect formal and informal learning experiences?
- What learning connections might there be, between cultures? How might educational innovations connect learners on a global scale?

Orchestration:

- Will new opportunities for personal and mobile learning prompt a transformation of schooling, or will learning in and beyond school be reconciled without any fundamental change to our education system?
- How can learning outside a formal setting be managed and supported?
- How do we decide what information from the WWW should be used for learning? How do we manage this data? How do we preserve it – or how do we decide what to lose? Should we be able to go back and change data? Does this mean we are altering history, and if so, should we try and capture this? How can we capture/revisit rich aspects from the past?
- What are the potential of mobile devices to support assessment, both in formal and non-formal settings?
- In what ways do we need to be mindful of ethical issues relevant to the changing contexts of the mobile learner such as context appropriate behaviours and responsibilities, privacy and informed consent?

Contextualisation:

- Should we model context to enable more adaptive contextual learning, or alternatively should we design rich tools to support awareness and continuity of learning across contexts? If both, then how can they be combined?
- How does adding artefacts from the physical or virtual world enhance learning?

c) *Network building among workshop participants*

Expertise (both technical and methodological) was shared between participants at the workshop, including the use of video capture from a head-mounted position and also the logistics (cost/sourcing) of various sensors for location detection.

Also there seemed to be research groupings that resulted from areas of common interest (mathematical location-based work; field trips; geocaching and treasure hunts), that formed organically during the workshop.

Several newcomers to the area also benefitted from being introduced to both the local workshop participants and also the wider STELLAR network, throughout the Alpine Rendez-Vous event.

It is anticipated that a theme team proposal, surrounding the issue of mobile learning, will result from this workshop.

4. State of the planned publication - special issue or book

A comprehensive report from the workshop will be published by the Learning Sciences Research Institute, University of Nottingham, in Spring 2010, edited by Elizabeth Brown and Mike Sharples.