MOBILE LEARNING TYPOLOGIES: TOOLS, TECHNIQUES, AND TEACHING STYLES

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11 January 2017
Mobile, Pervasive, Ubiquitous Learning

- **Mobility**
  - The use of portable technologies.
  - **Spatial mobility**: learners moving between different learning settings.
  - **Tool and thematic mobility**: learners alternating between different tools and topics of learning.
  - **Temporal mobility**
    - Learning’s dispersion in time makes it hard to define precisely the start and end of a learning episode
    - Learning is cumulative: current learning builds on previous learning and are the basis for future learning.
Effective use of new technologies requires a radical rethink of the core LEARNING AND TEACHING PROCESSES; a shift from design as an internalized, implicit and individually crafted process to one that is externalized and shareable with others. Change in practice may indeed involve the use of revised materials, new TEACHING STRATEGIES and beliefs - all in relation to educational innovation. Conole and Alevizou, 2010
MOBILE LEARNING: SOME FEATURES
Mobile Learning: some features

- Best viewed as **MEDIATING** tools
  - Mobile learning environment / applications are mediating tools in the learning process

- Part of a **WHOLE**
  - Mobile learning applications should be related to other learning tools used by students and teachers
  - Learning tools, activities, contexts, people and communities are distributed over time and space.
Mobile Learning: some features

- **Community**
  - Mobile learning is a **SOCIAL PROCESS** which links learners to communities, people and situations.
  - Learners are not taught by one teacher, but rather by a community. A learner can also teach others in the community.
  - Collaborative learning: learning happens in collaboration between people and technology.
Mobile Learning: some features

- **Locality**
  - Learning may occur in location and time which are significant and relevant for learners
  - Learning environment may be used in **AUTHENTIC** and appropriate contexts of use.
  - Learning is not only situated in classroom, but also outside
Mobile Learning: some features

- Situated learning
  - Learning occurs in the context of activities that typically involve an authentic task or problem, a location, a time, an environment, a community, etc.
  - This type of contextual learning fosters knowledge and skill acquisition
  - Increases learning quality
### TILES Model of [Situated and] Contextual Data

<table>
<thead>
<tr>
<th>Tile</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>T</strong></td>
<td>Temporal content contextualized according to time (e.g. current time and day of the year, current events, seasons, itinerary);</td>
</tr>
<tr>
<td><strong>I</strong></td>
<td>Identity content contextualized based on the user’s identity (e.g. interests, demographics, motives, food and activity preferences, activities already completed, language, budget, trip characteristics);</td>
</tr>
<tr>
<td><strong>L</strong></td>
<td>Location content contextualized based on the user’s movement and location (e.g. current location, nearby attractions, traveling speed and direction, mode of transport);</td>
</tr>
<tr>
<td><strong>E</strong></td>
<td>Environment content contextualized according to the user’s environment (e.g. weather, traffic conditions, congestion and availability, waiting times); and</td>
</tr>
<tr>
<td><strong>S</strong></td>
<td>Social content contextualized according to the user’s social setting (travel companions, group interests, nearby friends and family, recommendations, social media activity).</td>
</tr>
</tbody>
</table>

Source: Tan, et al. (2009)
Mobile Learning: some features

- (Hundebol and Helms 2006)

  « [A] pervasive learning environment is a context (or state) for mediating learning in a physical environment enriched with additional site-specific and situation dependent elements – be it plain data, graphics, information -, knowledge -, and learning objects, or, ultimately, audio-visually enhanced virtual layers“.

Typologies and Classifications of Mobile Learning Systems
## A typology of new technologies

<table>
<thead>
<tr>
<th>Technology</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Media sharing</td>
<td>Flickr, YouTube, Slideshare</td>
</tr>
<tr>
<td>Media manipulation and mash ups</td>
<td>Geotagged photos on maps, Voicethread, Google Places</td>
</tr>
<tr>
<td>Instant messaging, chat, web 2.0 forums</td>
<td>What’s App, Skype, GroupMe</td>
</tr>
<tr>
<td>Online games and virtual worlds</td>
<td>WorldofWarcraft, SecondLife</td>
</tr>
<tr>
<td>Social networking</td>
<td>Facebook, Myspace, Linkedin, Ning</td>
</tr>
<tr>
<td>Blogging</td>
<td>Wordpress, Edublog, Twitter</td>
</tr>
<tr>
<td>Social bookmarking</td>
<td>Del.icio.us, Citeulike, Zotero</td>
</tr>
<tr>
<td>Recommender systems</td>
<td>Digg, LastFm, Stumbleupon, Reddit</td>
</tr>
<tr>
<td>Wikis and collaborative editing tools</td>
<td>Wikipedia, GoogleDocs, Bubbl.us</td>
</tr>
<tr>
<td>Syndication/RSS feeds</td>
<td>Bloglines, Podcast</td>
</tr>
</tbody>
</table>

(Conole and Alevizou, 2010), Review of Web 2.0 tools in Higher Education
Thoughts on digital scholarship

I am giving a presentation on digital scholarship tomorrow at the OU, but in order to save people you know, actually turning up, here is the slidecast.

I'm putting together a book proposal around digital scholarship which will build on some content from this blog and explore some of these ideas, so the presentation was really a way to start exploring some of these ideas. The audio is a bit quiet but the slides are reasonably self-explanatory anyway. This is really an amalgamation of other bits, so not a lot new here, but it's a bit more than old wine in a new bottle.

What I'm interested in is whether the views we have of scholarship now, and particularly Boyer's definition hold true for digital scholarship. Put bluntly is it a case of doing the same things differently or are we starting to do different things?

I've characterised the digital scholar as being open, digital & networked. These are terms we use so frequently that they seem trite, but actually the combination of all three marks a very significant alteration, and potential for changes in scholarly practice.
Using Facebook

Grainne Conole
how can web 2.0 be used to combat social exclusion? thoughts please! will include in my Dehub keynote today

Thursday at 20:00 via Selective Tweets · · Like · Comment

Dominic Newbould Let them eat cakes? Let them have iPads...
Thursday at 20:25 · Unlike · 1 person

Philip Butler I'm doing some interesting project work with Kingston and Lewisham colleges taking Web2.0 ideas into e-Admissions. Utilising Amazon ideas so that learning providers can 'capture' and 'engage' with potential students who visit their websites to look at courses... does that make sense?
Thursday at 20:50 · Like

Grainne Conole excellent sounds good will mention that Phil – thanks!
Thursday at 21:10 · Like
Twitter - ideas for harnessing Web 2.0?

@cristinacost @gconole a blog for presence.blog ideas in progress, practice.establish the conversation.become accessible to others.=interactive portfolio
less than a minute ago via TweetDeck in reply to gconole

@watfordpete @gconole Collaborative bid/planning. Shared lit review. Wiki for rich story dev... Multiple perspectives...
23 minutes ago via Snaptu in reply to gconole

@cosmocat @gconole I know it shouldn’t be about tools but what about putting http://www.wallwisher.com/ & http://www.spicynodes.org/ to the test?
about 1 hour ago via TweetDeck

@cristinacost @gconole zotero – get your bibliography organised on the cloud.accessible from any computer. easy to retrieve biblio info
less than 20 seconds ago via TweetDeck in reply to gconole

@antoesp @gconole a wiki to share research plan in a group; a social network such as Cloudworks to pretest research questions & discuss method issues
half a minute ago via web in reply to gconole
Considering levels of functionality

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity</td>
<td>Flexible physical access</td>
<td>Capturing and integrating data</td>
<td>Communication and collaboration</td>
</tr>
</tbody>
</table>

**Sample applications**

- Calendars
- Schedule
- Contact
- Grading
- Local database
- Interactive prompting
- Just-in-time instruction
- Network database
- Data collection
- Data synthesis
- Mobile library
- Real-time chat
- Annotations
- Data sharing
- Wireless e-mail

| Content-intensive Users: Individual Mostly asynchronous Information storage Hardware-centred Isolation | Communication-intensive Users: Group Mostly synchronous Knowledge construction Network-centred Interconnection |

[Gay et al, 2002]
Typology of mobile-mediated virtual experiences

(Adapted from Hyun et al., 2009)
Considering the pedagogy [Naismith et al, 2004]

- **Behaviourist**
  - The learning system pushes content to the learner which can react and receives a feedback (e.g., quizz)

- **Constructivist**
  - Initiative is upon the learner that will have to build its own view and comprehension (e.g., simulations and micro-world)

- **Situated**
  - Applications use the context to provide a framework for learning (e.g., problem-based learning, field trip)

- **Collaborative**
  - The collaboration features provide a way to learn from and with others on the move
Considering the pedagogy [Naismith et al, 2004]

- Informal & lifelong learning
  - Applications that support ad hoc and situated learning
- Administrative support
  - No pedagogy there! But support of the institutional part of learning
Mixing functions & pedagogy [Patten et al, 2006]
Mixing functions & pedagogy [Patten et al, 2006]
MOBILE LEARNING APPLICATIONS
Field trip, museum visit...

- **Open University UK & University of London (Laurillard 2007)**
  - Teachers introduce an artist’s work
  - They provide a working guide for learners that work in pairs in the paintings gallery. Each painting has an associated code
  - Based on the guide, learners take notes, confront their observations with those of the teacher, have tests and collaborate with other learners
  - A follow up activity occur in the classroom where the students report on their work using an electronic whiteboard.
  - The teacher makes a summary of the different reports
As a mountain swells from magma pressure, its surface rises. Absolute altitude is constantly measured at numerous spots around the island to determine the rise and fall of ground level.

Additional information about this exhibit can be accessed using a QR (Quick Response) code reader app on your camera-enabled smartphone.

1) Download a QR reader app
2) Take a picture (scan) of this QR code to view the linked information.

Example of a QR Code used for museum interpretation and mobile learning
Google Maps Route

- A route was created
- Information for spots was created and collected by students
- Information is available via mobiles
- The route includes historical information: photos, videos, text
- Users follow the route and open information at certain spots
- Google Maps mobile application is free of charge
* Lepaa has currently 3 wikitude spots
* Users will be able to view the historical landscape 100 years ago in the mobile and compare it to current view
* Wikitude mobile application is free of charge
You can make your own AR app by visiting: http://www.wikitude.com/
Free context – happens anywhere

- **Skills Arena**
  - GameBoy-based video game to learn mathematics
  - Addition & subtraction exercises presented in a gameified style with marks, difficulty level included...

- **BBC Bitesize** (clickable)
  - Phone based revision system using SMS & Java games (650, 000 GCSE students in the UK)
ACTIVITY

• Visit the BBC Bitesize website at http://www.bbc.co.uk/schools/gcsebitesize/

1. Try some of the mobile learning materials.
2. What types of tools are offered?

4. Which is your favorite tool, and why?
Behaviourist

- Phone-based language learning
  - SMS messages to revise & memorize vocabulary (Thornton and Houser 2004)
- Classtalk: Classroom response system
  - 1st year students in physics, University of Massachusetts (Dufresne et al 1996)(e.g., www.bedu.com Better Education)
- Quizdom (Assessment for learning in the classroom, now defunct)
Constructivist learning / digital context / microworld

- Participatory simulations
  - Virus game (Collella 2000): students have an active role in the simulation of the system dynamics.
  - An active badge is worn by students. Proximity with another student/badge may spread the virus.
  - Students can define strategies to understand how the virus is spreading, who is the initial infected person(s), who is immune, etc.
Constructivist learning / digital context

- Savannah (Facer et al 2004)
  - Understanding animal behavior and defining strategies for surviving

- Environmental Detectives
  - Environmental investigation to discover the origin of a pollution...
  - Mixing digital & physical context
Situated learning / physical context + data collection

- Ambient Wood (Rogers et al 2002)
  - Children aged 10-12
  - Understanding relations between plants & animals in different woodland parts & seasons.
    - 1) Exploration & discovery of the site
    - 2) Reflection, organisation of data & hypothesis in class
    - 3) Define experimentations based on hypotheses
Situated learning / data collection

- Natural science Learning: Butterfly-Watching System (Chen et al 2004)
  - PDA + Wifi + Camera + database on butterflies
  - Take photos of butterflies & query the database for identification
Here is an opportunity to combine mobile learning while putting places in Bogotá, Colombia on the map!

We can call it: Pokémon CO... get it? 😊
Situated learning / data collection

https://www.ooklnet.com/web/
ACTIVITY

• Visit the OOKL website at https://www.ooklnet.com/web/

1. Work in groups of three or four.
2. What kind of information is being shared?
3. How might you spotlight a place that you know?
4. Choose one place you would put on OOKL and tell what you would include and why.
5. How will this place and the information you include about this place help people learn about Bogotá?
Mobile Game BioTrek

- a mobile game related to natural resources
- players select their own game character
- players collect points by visiting four different campuses and solving tasks

3D Harvester

- Students and teachers can together train processes related to the harvester, such as maintenance, harvesting, adjustments and cleaning.
- RealExtend

DISCUSSION QUESTION

Many younger generations have grown up in a culture where games and rewards incentivize performance. How do you feel about the idea of gamification in education?
MOBILE LEARNING PROJECTS
Mobile Learning Projects

- Mobile Computer-Supported Collaborative Learning
  - Universidad Catolica de Chile
    - Using PDAs to encourage collaborative face-to-face learning in primary & secondary school.
    - Wifi-based ad hoc network used
      - Teacher distribute activities to learners
      - Learners work in group of 3 to 5
      - Teacher collects results through PDA
Mobile Learning Projects

1. The teacher downloads the activity from the project website to his Pocket PC.

2. In the classroom, the teacher transmits the activity to the students using the mobile ad hoc network (MANET).

3. The collaborative activity is launched by the teacher. The students are assigned to teams that work collaboratively.

4. The teacher can monitor and discuss the individual and group learning activity.

5. The teacher downloads the data collected onto the school's PC and analyzes it. Additionally, this data is available, when uploaded, on the Internet.
Mobile Learning Projects

- **mLearning European project**
  - Teaching literacy to young adults (16-24 years old) that left the scholar system
  - M-Portal, Web & TV access, SMS, MMS
  - VoiceXML: interactive stories, quizzes. SMS for instructions & reminder
  - Pocket PC to browse content & for specific applications
Mobile Learning Projects

- **Mobilearn (2002-2005) project**
  - Nokia, Compaq, Deutche Telekom, Telecom Italia, Telefonica I+D, etc.
  - **Explored** new ways to use mobile environments to meet the needs of learners, working by themselves and with others. A new m-learning architecture supported creation, brokerage, delivery and tracking of learning and information contents, using ambient intelligence, location-dependence, personalization, multimedia, instant messaging (text, video) and distributed databases.
  - **Focused on**
    - The context-aware delivery of content and services to learners with mobile devices.
    - Appropriate actions and activities including interactions with others learners in the same or similar contexts.
Mobile Learning Projects

Context awareness architecture

- Context Awareness Subsystem
  - Recommendations
  - Content Metadata

- Content delivery subsystem
  - Content

- Sensor Input
  - Other Subsystems
  - User Profile
  - User Input
ACTIVITY

• Visit the “From e-learning to m-learning” website at http://learning.ericsson.net/mlearning2/project_online/index.html

1. Click to view “Documentation”.
2. Review the background technical documentation for the project.
4. How is learning enacted?
5. What affordances does this project provide learners?
6. Could this be applied in Colombia?
Mobile Learning Projects

- Ericsson & NKI (Denmark) : Leonardo Da Vinci Project
    - Designing and trying out the Environment for mobile learners
    - Results and conclusions
      - Working from home, the office and on travel
      - Increased feeling of flexibility
      - Few technical problems
      - Readability was good
      - Access to forum and pre-written messages
      - LMS should facilitate the mobile learner
Mobile Learning Projects

- Ericsson & NKI (Danemark) : Leonardo Da Vinci Project
  - Incorporating mobile learning into mainstream education (2005-2007)
    - Development of mLMS + Content
      - An always-online solution would possibly increase the quality of the services for mobile learners
Mobile Learning Projects

_Incorporating mobile learning into mainstream education_ (2005-2007)

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**nk**

- Hurtigvalg
- Innstillinger
- Studieinformasjon
- Sideoversikt
- Læringspartnere

Startside | spice 603, online teaching and learning | Forum: SPICE 603, Online Teaching and Learning

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**Question for reflection**

Truls Fagerberg 25. Jun 2004

**Sv: Question for reflection**

Morten Flate Paulsen 20. Jul 2004

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**Emne:** Question for reflection  
**Dato:** 25. Jun 2004

**Sv:** Question for reflection  
**Forfatter:** Truls Fagerberg

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What are the characteristics of online learners?

Online learners are often adults with full time jobs and family obligations. NKIs major group of students are between 25-40 years old and has their part-time education as secondary job? after family, friends and job. They are often very motivated and self-disciplined in their planning and conducting their studies.

What are the special needs of online learners?

Online learners need education that is flexible and relevant directly in their job. They want immediate feedback on assignments and progression and

Describe online learners' attitudes toward online education?

According to Rekkedals report, Courses on the WWW - Student Experiences and Attitudes Towards WWW Courses - II (1999), students thinks that online education facilitates efficient learning and good learning outcome. Students also states that they will enrol to a online course again and are in general very satisfied with courses taught one the web.

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Screen shot from the discussions forum on the PDA

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Screen shot from the discussions forum using an ordinary browser
Mobile Learning Projects

- One Laptop Per Child (OLPC)
  - the Media Lab of Massachusetts Institute of Technology, along with the World Bank, the United Nations and corporate investors, to provide a $100 laptop to many millions of schoolchildren in developing countries. The computers will not be available for sale, but will be distributed to schools directly through large government initiatives (http://laptop.media.mit.edu).
  - A personal, portable computer is an exciting opportunity for children to explore science and society, to develop new media literacies and to converse and share online.
  - An international community of researchers from more than twenty countries around the world, called G1:1 (globally, one computer for one person), (http://www.g1to1.org).
Mobile Learning Projects
MOBILE LEARNING ADMINISTRATION
Administration & institutional support

ERICSSON EDUCATION STUDY

- Teaching management
  - SMS
    - Course schedule modifications, messages to parents...
  - Examples
    - University of Ulster Northern Ireland: messages to students limited the rates at which they quit schooling.
    - University of Pretoria, South Africa: messages sent to distance students with no access to computer (postal mail takes 5 to 15 days)
Administration & institutional support

- Scaffolding through SMS, MMS and WAP
  - Communication et interaction with administration, other students & groups
  - Downloading study guides and manuals
  - Accessing online courses, tutoring, testing
    - Quizzes, feedback on exams and work, motivational messages,
    - Tutoring services
Administration & institutional support

- **Administratives services**
  - Downloading certificates
  - Institutional mobile portal
  - Grading, tests... all conducted through the portal or a phone call

- **Course registration & curriculum**
  - Subscribing to courses
  - Mobile curriculum (Corvinus University de Budapest)
Admin & institutional support – AND learning!

- **Ustad Mobile**

Mobile phones offer a promising channel to expand educational opportunities to Afghan women and girls, many of whom remain outside formal classrooms. Paiwastoon’s Ustad Mobile (“mobile teacher”) app teaches literacy in Dari over basic feature phones via video. A pilot project is currently underway using Ustad Mobile to train 200 Afghan National Policewomen in basic Dari Literacy. In 2012, the renowned Afghan Institute of Learning found that incorporating text messages into its basic literacy course for Afghan women halved the time required to attain basic proficiency from six months to three.

http://www.ustadmobile.com/lms/
HOMEWORK!

- Explore Ustad Mobile at http://www.ustadmobile.com/lms/
- What is your opinion? Could you use this tool?
- How does it compare to MIT App Inventor?
QUESTIONS?

Thank you!