Seamless and Contextualised Learning

Joint Technology-Enhanced Learning Summer School (JTEL 2015)

Dirk Börner, Roland Klemke and Alessandra Antonaci
11th Joint European Summer School on Technology Enhanced Learning

by Milos Kravcik — last modified Jul 02, 2015 11:30 PM

We are pleased to announce the 11th Joint European Summer School on Technology Enhanced Learning, to take place from Monday, July 6th to Friday, July 10th, 2015 in Ischia, Italy. Pre-summer school activities are organized all day on Sunday, July 5th. The summer school aims to encourage participants to adopt a critical stance in thinking about the role of technologies in providing opportunities for learners and the potential of these opportunities in terms of learning. The summer school provides a stimulating learning environment where participants are given opportunities to: develop research skills; increase their knowledge base; collaborate with others in their own and complementary research areas; engage in debate; have access to experts in the field; and discuss their own work. The programme covers topics from a broad range of domains which contribute to advancing the field of Technology Enhanced Learning. TEL research projects are encouraged to provide doctoral candidates with a perspective of the state-of-the-art research under study in their working groups. The programme will also include practical and methodological workshops as well as opportunities for doctoral candidates to develop their personal research and discuss their doctoral work. Upon request we can provide a certificate for the institution of the participant stating how much lectures / workshops and individual work was delivered.

((http://www.prolearn-academy.org/Events/summer-school-2015/))
The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it.

(Mark Weiser, 1991)
The people are fundamentally, inherently mobile – they move around; they never, never would want to be leashed tight to a desk or to their home or to their office if they have a choice.

(Martin Cooper, 2005)
Seamless Learning?

seamless ˈsiːmləs
adjective
(of a fabric or surface) smooth and without seams or obvious joins: seamless stockings. • smooth and continuous, with no apparent gaps or spaces between one part and the next: the seamless integration of footage from different sources.

We see ubiquitous access to mobile, connected, personal, handhelds creating the potential for a new phase in the evolution of technology-enhanced learning, marked by a continuity of the learning experience across different environments.

(Chan et al., 2006)
Portability
Social interactivity
Customisation
Context sensitivity
Connectivity
Combining

(Klopfer, Squire & Jenkins, 2002)
“Learning style where a student can learn [whenever they are curious] in a variety of scenarios and in which they can switch from one scenario or context to another easily and quickly, with the personal device as a mediator.”

(Chan et al., 2006)

“Seamless learner should be able to explore, identify and seize boundless latent opportunities that his daily living spaces may offer to him mediated by technology…”

(Wong, 2012)
10 Seams in Learning Support

- Encompassing formal and informal learning;
- Encompassing personalised and social learning;
- Across time;
- Across locations;
- Ubiquitous knowledge access;
- Combined use of multiple device types;
- Encompassing physical and digital worlds;
- Seamless switching between multiple learning tasks;
- Knowledge synthesis;
- Encompassing multiple pedagogical or learning activity models.

(Wong & Looi, 2011)
10 Seams in Learning Support

Across time (MSL4)

Ubiquitous access to learning resources (MSL5)

Multiple devices (MSL7)

Multiple learning tasks (MSL8)

Knowledge synthesis (MSL9)

- Physical + digital (MSL6)
- Personal + social (MSL2)
- Informal + formal (MSL1)

Multiple pedagogical models (MSL10)

(Wong, 2012)
TELI Program

Technologies

Learning

Enhancement

- New Learning Experiences
- Open Learning Analytics
- Mobile Seamless Learning
- Social Networked Learning

Open Practices and Social Innovation Processes
# INTERACTION CONCEPTS AND TECHNOLOGIES
Why Kinect?

Full Body Gaming
Controller-free gaming means full body play. Kinect responds to how you move. So if you have to kick, then kick. If you have to jump, then jump. You already know how to play. All you have to do now is to get off the couch.

Use Your Voice
Kinect uses advanced entertainment technology to respond to the sound of your voice. Just say "Xbox" to reveal a series of voice commands. So you'll be able to control HD movies with the sound of your voice—no remote required.

It's All About You
Once you wave your hand to activate the sensor, your Kinect will be able to recognize you and access your Avatar. Then you'll be able to jump in and out of different games, and show off and share your moves.

Something For Everyone
Whether you're a gamer or not, anyone can play and have a blast. And with advanced parental controls and movies for the family, Kinect promises a gaming experience that's safe, secure and fun for everyone.
Embodied Interaction

http://gameovenstudios.com/bounden/
<table>
<thead>
<tr>
<th>Feature</th>
<th>Moves</th>
<th>Gadgets (Nike+ Fuelband, Fitbit, etc.)</th>
<th>Sports tracking apps (Nike+ Running, Runkeeper, Runtastic, etc.)</th>
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<td>Automatic recognition of walking, bicycling and running</td>
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<td>No need to start and stop</td>
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<td>No need to charge and carry an extra device</td>
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Sensors

- Patient Position Sensor (Accelerometer)
- Airflow Sensor (Breathing)
- Electrocardiogram Sensor (ECG)
- Electromyography Sensor (EMG)
- e-Health Sensor Shield for Arduino and Raspberry Pi
- Galvanic Skin Response Sensor (GSR - Sweating)
- Blood pressure sensor (Sphygmomanometer)
- Pulse and Oxygen in Blood Sensor (SPO2)
- Body Temperature Sensor
# LEARNING ENHANCEMENT
Situational Awareness: “the perception of elements in the environment within a volume of time and space, the comprehension of their meaning and the projection of their status in the near future”

Endsley (2000)
1 Evidence
The radar-equipped sign flashes a car’s current speed.
First comes the data—quantifying a behavior and presenting that data back to the individual so they know where they stand. After all, you can’t change what you don’t measure.

2 Relevance
The sign also displays the legal speed limit—most people don’t want to be seen as bad drivers. Data is just digits unless it hits home. Through information design, social context, or some other proxy for meaning, the right incentive will transform rational information into an emotional imperative.

3 Consequences
People are reminded of the downside of speeding, including traffic tickets and the risk of accidents.
Even compelling information is useless unless it ties into some larger goal or purpose. People must have a sense of what to do with the information and any opportunities they will have to act on.

4 Action
Drivers slow an average of 10 percent—usually for several miles. The individual has to engage with all of the above and act—thus closing the loop and allowing that new action to be measured.

http://www.wired.com/2011/06/ff_feedbackloop/
# RESEARCH AND DEVELOPMENT
Multiperspective multimodal dialogue system with metacognitive capabilities

http://www.metalogue.eu
Feedback Cubes
10 Seams in Learning Support

(Wong, 2012)
### Seamless Learning Experiences

#### 11th Joint TEL Summer School - Ischia, Italy

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<td>MOOCs: Reexamining our Assumptions</td>
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Mobile contextualized learning games for decision support training

Roland Klemke

JTEL Summer School
Ischia, 07.07.2015

Welten Institute
Open University of the Netherlands
Heerlen, The Netherlands
http://www.ou.nl/

Gamedesign Faculty
Mediadesign Hochschule
Düsseldorf, Germany
http://www.mediadesign.de/

Humance AG
Cologne, Germany
http://www.humance.de/
Have you ever watched little children learning? Or playing?
Discovered any difference?

“Fun is the original educational technology.”
– Chris Crawford

How to unite gaming and learning again?

How to place learning and gaming in context?

Learners are individual and mobile

How can we provide learning resources with ...  
— ... different media formats  
— ... different devices  
— ... different target audiences?

How can we personalize learning ...  
• ... for the learner ...  
• ... in the learning context?
GIVING ACCESS IS ONE THING ...

... MAKING IT FUN ANOTHER
MOBILE SERIOUS GAMES

Situation Awareness
Augmented Reality
Serious Gaming
What is a mobile serious game?

- Embedded in Context
- Exploration and utilization of context
- Augmentation of reality
EmUrgency: Mobile Game for Basic Life Support Training

Cardiac arrest one of the main causes of death
Only 20% of affected people survive

But: bystanders often don’t know what to do or fear to do the wrong things

EmUrgency: Mobile Multi-user Game for Basic Life Support

Learn what to do, where to find resources, how to organise help

SALOMO
Decision training for disruption handling in logistics

Klemke, R., Kurapati, S., & Kolfschoten, G. (2013). Transferring an educational board game to a multi-user mobile learning game to increase shared situational awareness. Presentation at the 3rd Irish Symposium on Game Based Learning, Dublin, Ireland.
Mobile learning game based on team processes simulate disruption situations

From board game to multi-user mobile learning game

Klemke, R., Kurapati, S., & Kolfschoten, G. (2013). Transferring an educational board game to a multi-user mobile learning game to increase shared situational awareness. Presentation at the 3rd Irish Symposium on Game Based Learning, Dublin, Ireland.
ARLearn: Platform for mobile serious games

- Sensor enabled (location, camera, QR)
- Multi-user, multi-role game play
- Clients for Android and iOS
- Open Source
- [http://ou.nl/arlearn](http://ou.nl/arlearn)
- [https://code.google.com/p/arlearn/](https://code.google.com/p/arlearn/)

10 Seams in Learning Support

(Wong, 2012)
## Seamless Learning Experiences

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**11th Joint TEL Summer School - Ischia, Italy**
AUGMENTED REALITY WORKSHOP
FROM MOBILE TO WEARABLE
Alessandra Antonaci
Research Fellow at the ITD (Institute of Educational Technology) of CNR (Italian National Research Council)
External PhD at the Welten Institute of the OuNL
OVERVIEW

1950
Morton Heiling
first appearance of AR

1968
Sutherland
1st AR system

1975
Myroa Krueger
Videoplace

1997
R. Azuma
1st Survey

2000
B. Thomas
1st outdoor AR
AUGMENTED REALITY DEFINITION

- Azuma’s (1997)* Survey defines AR as systems that have the following three characteristics: (1) Combines real and virtual (2) Interactive in real time (3) Registered in 3-D

- Augmented Reality enhances a user’s perception of and interaction with the real world. The virtual objects display information that the user cannot directly detect with his own senses. The information conveyed by the virtual objects helps a user perform real-world tasks.

![Figure 1: Milgram’s Virtuality Continuum](image)

AR is considered by Milgram and Kishino as a portion of the overall subject area of mixed reality, represented as a continuum because the elements which compose both AR and VR are the same but mixed in a different way; on the left the real environment is enriched by virtual objects (AR), but elements of reality are still available in Augmented Virtuality, as a continuum indeed where the virtual environment is enriched by real elements.

AR’s strong point is that users can experience both realities through it: augmented and the traditional one; the latter is enriched by a series of virtual objects put into it in a contextually relevant manner (Bower, et al. 2014) (Ternier, et al., 2012).
**AR FEATURES**

- **Powerful processor** to either compose virtual and real objects or display a 3D-simulated environment in real time.

- **Ample storage space** for virtual objects.

- **Video camera** to capture live images.

- **An interface** that allows the user to interact with both real and virtual objects.
PRESENT: APPLICATIONS

**MEDICINE** - Anatomy 4D (Android, iOS) gives you a virtual tour of the human body developed by DAQRI

**STREET MARKETING** - Nokia with Nokia Lumia and Victoria’s Secret

**MILITARY** - ARC4 developed by Applied Research Associates, Inc. (ARA)

**TRAINING AND SUPPORT ON THE JOB** - DAQRI Smart Helmet
10 Seams in Learning Support

(Wong, 2012)
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