

Mixed Reality Learning: Exploring the Implications of Augmented Reality Learning Content

[Position Paper] *Technology-enhanced Learning in the Context of Technological, Societal and Cultural Transformation - WORKSHOP*

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Key words: *Augmented reality, emerging technologies, education, learning-content, mixed-reality, m-learning, pervasive-learning, ubiquitous learning.*

ABSTRACT:

This position paper is an effort to make a useful contribution to the *Technology-enhanced Learning in the Context of Technological, Societal and Cultural Transformation Workshop*, by providing the framework for a structured appraisal of the social and cultural impacts of augmented & mixed reality learning scenarios. The ideas presented in the paper are intended to inspire further in-depth research into how mixed reality learning and augmented reality content could potentially re-shape how learning and education are approached.

INTRODUCTION:

"It's time for the Web to engage the real world."

- *Tim O'Reilly and John Battelle*

"As our lives become increasingly digital, and information about our environment becomes both more contextual and readily available, we will soon want to interact with the ever-growing amounts of information and expect capabilities provided by mobile technology to be delivered in more intuitive and convenient ways."

- *Nokia Research Center*

Discovering and examining innovative ways to harness and use mobile technologies and services to enhance learning and education is one of the goals of The London Mobile Learning Group. It is within this spirit that I propose to explore the emergence of Mixed Reality Learning (MXRL) and explore the implications of how Augmented Reality (AR) content will effect and re-shape how we learn within formal and in-formal learning contexts.

The capacity for the "Web to engage the real world"¹ and to help shape the physical world as a platform through a digital and physical fusion is increasingly becoming more mainstream.

1. O'Reilly, Tim and John Battelle. (2009). Web Squared: Web 2.0 Five Years On. Online: <http://www.web2summit.com/web2009/public/schedule/detail/10194>

This ability to combine digital media / information and augment the physical world is commonly referred to as Mixed Reality. Moreover, this ability to fuse digital media within the physical gives way to the potential for Mixed reality learning which creates the ideal conditions for locative, contextual and situational-based learning scenarios. Recent advances in mobile technologies are primarily to reason for the ability for mixed-reality learning scenarios to emerge. "The incorporation of various rich sensors into new phones such as GPS location, wireless sensitivity, compass direction, accelerometer movement as well as sound and image recognition are enabling new ways in which we are able to interact with the world around us."² Furthermore, the tools (software) and technologies (hardware) are more evenly distributed and are at our disposal to deploy mixed reality learning scenarios that deliver rich, immersive, augmented reality content which could potentially re-shape how individuals and groups approach learning and education.

The purpose of this position paper is to provide foresight into the potential adoption and future utilization of augmented & mixed reality learning scenarios within formal and informal learning contexts. The insights and experiences shared here have been developed from personal and professional experience with creating and utilizing mixed-reality mobile learning content. It is proposed that the discussion surrounding this topic take into consideration the social and cultural impacts of augmented & mixed reality learning scenarios. As a further matter, this position paper would provide a starting point to explore the implications of how augmented reality learning content could fundamentally change the way mobile learning is approached. Furthermore, this position provides a starting point for exploring the implications of how mixed reality learning and augmented reality learning content could fundamentally change the way mobile learning is approached.

EVALUATION / REFLECTION:

As mentioned this position paper provides a starting point for exploring the implications of mixed reality learning and augmented reality learning content. In order to facilitate this exploration the following topics and questions will be explored and discussed during the workshop:

Topics for Exploration:

(This list has been adapted from research topics examined by the Nokia Mixed Reality Experiences team.)

- Personal learning content: public available learning content with a personal attachment and user-created content;
- Mobile-mixed reality learning content ecosystems and associated experiences;
- User experience research on services in personal content ecosystems
- Creating mobile mixed reality learning content ecosystems: physical environment as an interface, storage and retrieval space for learning content
- Augmentation of the physical world using mobile devices as creator of new value for both formal and informal learning;

2. Nokia Research Center, NRC. (2009) *Mobile Mixed Reality: The Vision*. Nokia Technology Insights series | Nokia Research Center (NRC) | June 2009

- User data (learning content and metadata): fusing the physical with digital with a focus on people, places and time
- Lifelogging as the capture, storage and distribution of everyday experiences and information for people and objects
- Mobile, collaborative, massively multi-learner, augmented reality
- Multimodal (photos, video, audio): synthetic representation of the world, delivery of tailored learning experiences;

Questions for Discussion:

- Which technological, societal and cultural transformations would be expected from augmented reality and mixed-reality learning?
- How would augmented reality learning content fundamentally change the way mobile learning scenarios are implemented and delivered?
- What will be the impact of augmented reality and mixed reality learning scenarios on education?
- Is mixed-reality learning compatible with existing formal learning structures?
- How will mixed-reality learning content influence informal and non-formal learning?

REFERENCES / RESOURCES:

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3. O'Reilly, Tim and John Battelle. (2009). Web Squared: Web 2.0 Five Years On. Online: <http://www.web2summit.com/web2009/public/schedule/detail/10194>
4. The London Mobile Learning Group, (2009) *Socio-cultural Ecological Approach to Mobile Learning: An Overview*. Workshop Background Paper. [PDF](#) - [Download](#)

Further Reading:

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Videos:

- Augmented Reality by Hitlab - http://www.youtube.com/watch?v=ZKw_Mp5YkaE
- Augmented Reality Kanji Learning - <http://www.youtube.com/watch?v=NPQ5sVt8RHg>
- Mixed Reality Learning Media: effects in classroom education - <http://www.youtube.com/watch?v=iT2ek8NOVIY>
- Pattie Maes and Pranav Mistry demo SixthSense - http://www.ted.com/talks/lang/eng/pattie_maes_demos_the_sixth_sense.html
- Realta Aumentata - Augmented Reality - The future of education - <http://vimeo.com/2341387>

URLs - Bookmarks:

- <http://groups.diigo.com/group/mixed-reality-learning>
- <https://twitter.com/mxrlearning>