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Advances of Scientific Research on Technology Enhanced Learning in Social Networks and Mobile Contexts: Towards High Effective Educational Platforms for Next Generation Education

J.UCS Special Issue

Miltiadis D. Lytras
(The American College of Greece – Deree College, Athens, Greece
mlytras@acg.edu)

Leyla Zhuhadar
(Gordon Ford College of Business, Western Kentucky University
Bowling Green, USA
leyla.zhuhadar@wku.edu)

Jacky Xi Zhang
(Dept. Information Management and Management Science
College of Management and Economics, Tianjin University
Tianjin, P. R. China
jackyzhang@tju.edu.cn)

Eugenijus Kurilovas
(Centre for Information Technologies in Education; Vilnius University Institute of Mathematics and Informatics; Vilnius Gediminas Technical University
Vilnius, Lithuania
Eugenijus.Kurilovas@itc.smm.lt)

Abstract: This editorial presents the latest advances of scientific Research on Technology enhanced learning in social networks and mobile contexts. It summarizes the key finding and promotes three main pillars for future scientific contribution to the domain namely: Enabling Technologies, Educational Strategies, and Next Generation Social Networks for Educational Purposes. It can serve as a position document for scientific debate fostering international collaboration and empirical research in the various aspects of the well-defined agenda. It can also serve as a reference edition for researchers interested in the adoption of Social Networks, in the Education Sector.

Keywords: Social Networks, Mobile Technologies, Education 2.0, Personal Learning Environments, HORIZON 2020, Technology Enhanced Learning
Categories: L.2.3, L.5.0, L.6.1

1 Introduction

The advances on mobile technologies, ubiquitous networks, and content management systems created a new context for the delivery of learning content in flexible formats.

Smartphones, tablets, intelligent devices, and other portable systems allow access to learning services anytime anyplace. In this fashion, limited scientific research on the effectiveness of mobile learning and adoption of social networks in academia and other forms of training motivated the preparation of this special issue. We received a significant number of scientific articles and after rigorous double blind review we summarize in this special issue nine articles.

The scientific debate about the contribution of mobile learning and social networks investigates three critical pillars for the effectiveness of learning in various contexts including academia, k-12, executive training, vocational training and lifelong learning:

Pillar 1: Enabling technologies

The vast evolution in mobile technologies, cloud computing, web services and open source tools set critical challenges for the design of effective learning platforms aiming in exploiting modular technological systems that can be customized and personalized, forming, personal learning web spaces.. Many open scientific issues need a bold answer. The following is a limited list of key, open questions and potential topics for further research in the context of master thesis or doctoral studies:

- Design guidelines for mobile personalized educational systems enabled by social networks and cloud computing
- Open Architectures for learning content delivery including conversion of old technology enhanced learning systems to Web 2.0 Education
- Integration of Semantic web approaches for enhanced educational quality and customization.
- Representation of Meaning in Social Networks
- Automatic extraction of Learning Profiles and adoption of learning content based on matching patterns
- Formation of Content 2.0 sphere a collaborative working and learning space, where content is powered by well-defined standards beyond the traditional established ones for e-Learning e.g. LOM, SCORM etc.
- Integration of Data warehouses for micro content learning management.
- Advanced techniques for dynamic construction of learning social networks including identification of similar learning profiles, matchmaking of profiles with learning strategies
- Advanced approached for visualization techniques of learning social networks
- Security Models against cheating and fraud

Pillar 2: Educational Strategies

There is an open scientific discussion for the integration of technologies in the context of specific, targeted, justified educational strategies. Mobile learning sets many gray areas, in the sense of unexplored strategies, since sometimes the flexibility of technologies and the design of learning networks through available technologies is not based on theories or well tested models. In a way, there is a common misunderstanding that typical strategies of the Web, or E-learning domain will work also in the context of Social Networks and Mobile Technologies.

The following are few open issues related to Mobile Educational Strategies:

- Self-paced learning educational mobile strategies
- Evaluation of mobile learning outcomes, and adoption of Learning Objectives in scenarios of varied difficulty
- Justification of Value adding contribution of mobile networks to well defined learning objectives
- Promotion of collaborative learning through mobile learning
- Justification of selection criteria of smartphones, mobile devices, and tablets for well-defined educational objectives
- Dynamic composition of Collaborative Learning Spaces, utilizing the power of social networks to provide significant information for the skills and capacities of participants
- Linkage of Social Networks Profiles to Learning Profiles with the integration of additional educational based profiles.

Pillar 3: Next Generation Social Networks for Educational Purposes

The global domination of few Social Network platforms a.k.a Facebook, has developed an increased awareness of social network platforms, even for educational purposes and "learning". At least this is the basic assumption of trainers and educators around the world that incorporate in their teaching learning tools powered by Facebook or Twitter. In parallel regional initiatives like the programs FP7 or HORIZON 2020, funded by the European Union, promote the scientific research towards next generation learning technologies. The paradox in all these approaches is the limited adoption of the proposed methodologies, designs and infrastructures from the "relevant markets" e.g. academic institutions, universities. It is obvious that there is a key performance gap, derived from the absence of fast response of academic organizations to this "thrilling revolution" of social networks. In a way inflexible academic structures and traditional curriculums provide the resistance to change, where the basic scenario of the change is that modern students are happier to use their mobile phones and intelligent portable devices for everything even for learning than going to a class. In this context there is an interesting challenge, well predicted, that in the short future there will be a critical need for next generation Social Networking platforms for Educational use. The following list provides an indicative list of topics for further research towards Next Generation Social Networks for Educational Purposes:

- Dynamic composition of learning spaces based on mobile learning pedagogies
- Personalized apps based on learners profiling and matching
- Dynamic semantic annotation of profiles and content towards the integration of personal learners entities to qualitative learning content
- Taxonomies of Learning Objectives for Social Networks
- Artificial Intelligence approaches towards the sustainability of learning communities powered by social networks
- Mapping of related learners at global scale
- Cloud Services for Learning Spaces
- Security and Evaluation

2 Overview of research articles in this issue

Nine full research articles are presented in this special issues. They all provide significant insights for the special theme and set an interesting context for further scientific debate. The main concepts that are investigated are related to: Prototyping Modeling for Educational Platforms, Semantic Web Adaptation of Learning Quality, Management of Digital Elevation Models, Social Knowledge Construction, Self-learning Approaches, Mobile Databases Management, Smartphones Use in Social Networks etc :

- Incremental Prototyping Model for the Development of Educational Platforms: a Process of Design and Quality Standards
- Several Semantic Web Approaches to Improving the Adaptation Quality of Virtual Learning Environments
- A Compression Algorithm for Managing Digital Elevation Models in Mobile Devices
- Chat as a tool for social knowledge construction using asynchronous discussion groups in Economics Degree
- Self-learning Mobile Robots Navigation in Unknown Environment using Evolutionary Learning
- A Novel Vertical Fragmentation, Replication and Allocation Model in DDBSs
- Exploiting the Performance-Energy Tradeoffs for Mobile Database Applications
- ICTs, Mobile Learning and Social Media to Enhance Learning for Attention Difficulties
- When are Tweets Better Valued? An Empirical Study

3 Conclusions

The topic of this special issue is significant. The great majority of the literature the last three years for learning and knowledge management is focusing on Social Networks and Mobile Contexts. The contribution of this special issue is unique. It sets new direction for future research and provides a full discussion of critical thinking and comparative studies on the phenomena under analysis. We are at the disposal of the readears for further analysis and collaborations in the domain. Currently we are preparing two proposals for next generation social networks for learning under the HORIZON 2020 program.

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