Chapter XIV

The Future of Technology Enhanced Active Learning: A Roadmap

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Inside Chapter

The notion of active learning refers to the active involvement of learner in the learning process, capturing ideas of learning-by-doing and the fact that active participation and knowledge construction leads to deeper and more sustained learning. Interactivity, in particular learner-content interaction, is a central aspect of technology-enhanced active learning. In this roadmap, the pedagogical background is discussed, the essential dimensions of technology-enhanced active learning systems are outlined, and the factors that are expected to influence these systems currently and in the future are identified. A central aim is to address this promising field from a best practices perspective, clarifying central issues and formulating an agenda for future developments in the form of a roadmap.

Introduction

Activity and interaction are central in learning processes. Technology-enhanced learning (TEL) software can act as a mediator between the learner and the learner's environment, that is, content, peers, and instructors. Engaging the learner to actively learn is a central objective towards deeper and lasting learning experiences. With recent technology advances, for example in multimedia and Web technologies, a shift from purely knowledge-based learning towards activity-based learning and training can be observed. Interactive Web and multimedia technologies are enablers of skills-oriented training in technology-enhanced learning environments. In a wide range of areas from technical and scientific applications to language learning, training of activities and skills is of paramount importance.

The overall aim of this chapter is to address emerging technologies for new-generation TEL and challenges for the future. This investigation targets a specific form of learning—active learning and training—and its technology support. A reflective analysis of existing technology-enhanced active learning (TEAL) environments shall establish the state-of-the-art and best practice. Based on major dimensions of these environments, external factors are identified that are likely to have an impact on their development and deployment in the future. Their impact on active learning support is examined and emerging trends, challenges, and possible solutions are discussed. The aim is to identify a realistic roadmap scenario for future technology-enhanced active learning.

Based on an analysis of the state-of-the-art, dimensions of technology-enhanced active learning environments and external factors that influence these are identified (Figure 1). The factors can be categorised along the dimensions as follows: (a) modelling, architecture, and development, (b) interoperability, delivery, and standards, (c) learning and systems evaluation, and (d) evolution. A discussion of the pedagogical context of activity-based learning and training and an analysis of some sample systems complements the discussion of the four dimensions. The dimensions are relevant in terms of best practices considerations:

- Pedagogy addresses the skills training perspective necessary for a wide range of subjects.
- Development addresses the effective and efficient development of TEAL environments.
- Change and evolution capture the mid- to long-term perspective on TEAL deployment.
- Examples for analysis are relevant for both development and deployment.
- Implementation addresses exchanges and reuse through interoperability.
- Evaluation focuses on the effectiveness of approach and environment.