

# Chapter 5.10

## Collaborative Knowledge Construction in Virtual Learning Environments: A Good Practice Example of Designing Online Courses in Moodle

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### ABSTRACT

*In this chapter, a practical example of designing and implementing a Virtual Learning Environment (VLE) building on aspects of collaborative knowledge construction is presented. Based on a theoretical section on collaborative knowledge construction in VLEs, the potential of the VLE Moodle with regards to its collaboration tools is introduced. The subsequent central section of the chapter has a focus on the actual design and implementation of an online course in Moodle, following principles of constructivist course design. The final two sections reflect on the evaluation of the course by course participants, and possible conclusions to be drawn from designing and implementing the online course.*

### INTRODUCTION

The relevance of collaborative learning is emphasised with regard to computer-based educational and instructional approaches. Theory and research of educational communication processes and the

use of technologies for communication purpose (cf. Jonassen, 2004) is discussed widely and related challenges and possibilities for the facilitation of effective learning processes are taken into account in the current discussion (cf. Bromme, Hesse & Spada, 2005). The book at hand brings in new perspectives on the topic of computer-based collaborative knowledge construction and in this

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chapter the authors aim at contributing to the book by providing a practical example of designing and implementing a Virtual Learning Environment (VLE) for collaborative knowledge construction.

In general, for the implementation of online courses a large variety of VLEs is available (e.g. Blackboard, Sakai, Moodle, ATutor, etc.) which all have different functionalities for the design of learning activities and processes. For the online course described in this chapter the VLE Moodle was chosen due to its Open Source nature and the large developer and user community behind it. It allows course designers to build on an extensive knowledge base of pedagogical and technical solutions for Moodle course implementation. Furthermore, the VLE Moodle has an explicit orientation towards learning from a social constructivist perspective (cf. Cole & Foster, 2007). This was also an important aspect for choosing Moodle, because the pedagogical approach of the online course is based on theory of collaborative knowledge construction in VLEs. In this context the authors consider three central aspects for the design and implementation of VLEs from a constructivist and situated learning perspective: *Guiding learners, feedback and support processes* and *recognising learning processes*. The theoretical outline on collaborative knowledge construction in VLES is provided in the second section of this chapter, following the introduction part. Further details on specific aspects of designing courses with Moodle are then provided in the third section with a focus on utilising collaboration tools.

The fourth section is the central part of this chapter. It describes the so called ICT4T online course. The course was designed and offered in the frame of the “ICT4T – ICT Training for Trainers – Meeting Senior Learner Needs” project, which was financially supported by the Socrates Grundtvig Programme of the European Union (<http://www.ict4t.net>). The participants of the ICT4T course were trainers interested in computer-based teaching for the specific target group of senior learners. The ICT4T course itself was presented

as an example of designing courses based on collaborative knowledge construction with a VLE. The authors of this chapter were responsible for the pedagogical and technical implementation of the ICT4T course, and both authors implemented several other online and blended learning environments with Moodle. Furthermore, they worked as tutors in the ICT4T course offers and other Moodle courses. Therefore, the description of the course implementation process refers to practical experiences of the authors.

The evaluation results of the course are described in section five. The focus is on data which provides information on the course implementation, taking into account the aspects *guiding learners, feedback and support processes* and *recognition of learning*, which aimed at supporting collaborative knowledge construction. Finally, in the concluding section the authors discuss the design and implementation of the ICT4T course from a perspective which considers technological and pedagogical challenges of designing VLEs for collaborative knowledge construction.

## **COLLABORATIVE KNOWLEDGE CONSTRUCTION IN VIRTUAL LEARNING ENVIRONMENTS**

From a perspective of situated cognition, learning is seen as a process of active knowledge construction by learners, situated in a specific physical, social, cultural and historical context. It is based on a constructivist understanding of learning which sets a focus on the learners and their active role in constructing knowledge (cf. Mandl, Gruber & Renkl, 2002). Collins, Brown & Duguid (1989) explain that conceptual knowledge is linked to the situation in which it is acquired through active application and interaction within situations. It is distinctive for authentic activities that their meaning is socially negotiated, taking into account the cultural frame of the domain and situation. Similarly, Lave and Wenger (1991) consider

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