Chapter 19
Designing a Model for Enhanced Teaching and Meaningful E-Learning

Heli Ruokamo
University of Lapland, Finland

Päivi Hakkarainen
University of Lapland, Finland

Miikka Eriksson
University of Lapland, Finland

ABSTRACT
In this chapter, we describe the informed design of a specific pedagogical model in the context of higher education. We have developed the model of Enhanced Teaching and Meaningful e-Learning to design, implement, and evaluate the use of educational technology. Although a great number of pedagogical models already exist, we argue that development of new models remains crucial. Despite decades of development, teachers still need functional examples of how to use educational technology in a pedagogically meaningful way. In this chapter, we present a theoretical framework for our model design, taking into account previous models and characteristics of meaningful learning. We then present our research strategy along with the research questions we have posed. Additionally, we describe the course we have designed and implemented as well as the participants in this course. We follow this with an evaluation of successes, both in the course implementation, as well as the model design. Next, this chapter will present our data collection and analysis methods, as well as the research results. Finally, at the end of the chapter, we present future research trajectories of the model and recommendations for how to further develop the course.

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**INTRODUCTION**

In this chapter, we provide a description of this research, which aims to create a pedagogical model for designing, implementing and evaluating meaningful e-learning in higher education. More specifically, our aim is to transform an existing pedagogical model (the pedagogical model for teaching and meaningful learning [TML]) into a model for enhanced teaching and meaningful e-learning. In order to achieve this aim, we conducted a design-based research (DBR) study that focused on the national Finnish inter-university e-learning course *Pedagogical and Learning Theoretical Approaches to Educational Use of ICTs* (4 ECTS, European Credit Transfer System credits). Participants of the study were 22 students from three Finnish universities. This e-learning course builds on the principles of the TML model and, thus, offers a framework with which to study the modification of the model as a teaching and meaningful e-learning model. Our aim is to develop the course further and to design a model that functions as a theoretical foundation for the informed design of educational technology in higher education.

We argue that development of pedagogical models (see Joyce & Weil, 1980) is still crucial, as teachers are not yet fully aware of how to use technology in pedagogically appropriate ways. An effective pedagogical model will make teachers aware of the different means available to them, it will help in the designing, implementation, and evaluation of e-learning and it will ensure that students benefit from a more meaningful learning experience.

**THEORETICAL BACKGROUND**

The researchers engaged in this study have been developing pedagogical models for network-based education since the beginning of 2000, starting with the development of the integrated model for network-based education (see Tissari, Vahtivuori-Hänninen, Vaattovaara, Ruokamo, & Tella, 2005). The concept of a network refers here to both collaborative and technological networks. Over the past ten years, we have further developed the models based on previous research findings. In this study, the pedagogical model for teaching and meaningful learning (TML, see Figure 1) (Hakkarainen, 2007, 2009; in press; Hakkarainen, Saarelainen, & Ruokamo, 2007, 2009) guided the design, implementation, and evaluation of the e-learning course *Pedagogical and Learning Theoretical Approaches to Educational Use of ICTs*.

The development of the TML model was based on the integrated model of network-based education, which has its foundational roots in the ideas of meaningful learning put forward by Ausubel (1963) and Jonassen (1995). Ausubel presented the significance of meaningful learning in his cognitive learning theory (Ausubel, 1963, 1968; Ausubel, Novak, & Hanesian, 1978), while Ausubel et al. (1978) later distinguished between logical meaning and psychological meaning, which is the product of a meaningful learning process. Meaningful learning depends on the student’s ability to relate new concepts and propositions to what they already know. Ausubel et al. (1978) combine the concepts of meaningfulness and personal significance, which has become a common practice in the field of education (Yrjönsuuri & Yrjönsuuri, 2005). In the TML model, meaningful learning includes the additional aspect of personal significance, which is conveyed by including the characteristic of the “individual” in the model.

The TML model consists of teaching and meaningful learning, which is defined in terms of 17 procedural characteristics and their expected outcomes, including domain-specific and generic knowledge and skills. The model also includes pedagogical models or approaches (e.g.,