Chapter 4
Design of an Authentic E–Learning Environment

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ABSTRACT
The increasing necessity of a lifelong learning attitude has its influence on the ageing population in Western societies. Employees nowadays cannot rely on their skills once learned in school. Most, also older, employees have to keep up by learning new insights, new skills, and new knowledge. A lot of money is invested in training and further education. New technology can play an important role here. This chapter will give an insight into the development of an authentic multimedia learning environment to support lifelong learners. More specifically, it has been developed in order to improve learning materials in terms of giving the right amount of scaffolding at the time when it is needed to increase the motivation and the performance of the (older) learner. A design that adapts cognitive load theory to minimise cognitive overload was embedded in an authentic context that, as a result, provided a fruitful basis for authentic and simulated learning environments addressing both younger and older adults.

INTRODUCTION
In the beginning of the new technology era, faith was put in the fact that only the use of new technology could genuinely improve learners’ motivation, learning approach, and their learning results. The educational technology community learned the lesson the hard way, that the mere usage of new technology alone would not improve anything. New technology can be seen as just another medium that can be used, as one can also use a teacher, books, or other educational media. From the author’s point of view, it is of foremost importance that new technology is embedded in a systematic instructional design that makes sense. However, there are many instructional design (ID)
models from which to choose. Some ID models are grounded in learning psychology fundamentals like behaviorism or cognitivism. Others are more prescriptive like, for example, the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model. Another category is the phenomenological ID model which takes, for example, situated learning theory or the theory of andragogy as its starting point. In general, all ID models try to translate theoretical assumptions to practical and applicable steps to be taken when developing learning situations, learning materials, or new technologies. The only dilemma and question to be resolved is which ID model to adopt? This is of great importance in designing digitally-supported, authentic, and simulated learning environments for adult and lifelong learning. In the project reported in this chapter, the question was answered by combining ground rules from different theories. That combination finally led to one ID model (The Four-Component Instructional Design Model) that fitted very well with the particular requirements of the project, and also has applicability to undertaking other authentic e-learning designs.

THEORETICAL PERSPECTIVES FROM ADULT AND LIFELONG LEARNING

In the project featured in this chapter, a multimedia environment for older learners was developed. Knowles (1975) developed a theory of andragogy to understand and support adult learning. It emphasises that adults are self-directed and do expect to take responsibility for their decisions. Moreover, the theory of self-regulated learning emphasises that students are more effective when they take a purposeful role in their own learning. Multimedia learning environments should therefore not only state why learners need to learn the content, and how the knowledge will be immediately applicable, but these environments should also facilitate a self-directed learning process in which the learner can utilise his/her life experience (Knowles, 1975). On the other hand, with age comes the tendency to become less explorative but to turn into a more hands-on, more reflective, and observant learner instead. Minimal guidance, and the very often used discovery learning where learners must construct essential information, might therefore be challenging.

As learning research, in general, reveals the importance of providing learners with an authentic context to support learning, and andragogy finds this especially poignant, the concept of situated learning can be considered as a possible framework. Collins, Brown, and Newman (1989) developed the theory of situated learning to increase the knowledge transfer from classroom instruction to real-life applications (Park & Hannafin, 1993; Young, 1993). Taking further findings of research on lifelong learning into account, for example, that adults prefer learning materials that relate to their pre-existing knowledge and experiences, therefore makes it even more plausible that adult learners prefer authentic tasks above conventional ones. So, a possible ID framework has to offer learners a structure where they can direct their own learning and apply their learning strategies to move at their own pace through the materials.

DESIGNING AUTHENTIC LEARNING ENVIRONMENTS

In integrating the theory of situated learning, Herrington and Oliver (2000) suggest nine design recommendations for authentic learning environments:

- Provide authentic contexts that reflect the way the knowledge will be used in real life.
- Provide authentic activities.
- Provide access to expert performances and the modelling of processes.
- Provide multiple roles and perspectives.
- Support collaborative construction of knowledge.
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