## Chapter XVII

# A Special Purpose E-Learning Environment:
## Background, Design and Evaluation

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## Abstract

*This study presents the concept of Special Purpose E-Learning Environments (SPELEs). The main aim of these environments is to meet the learners' individual learning differences related to a specific learning subject. An architecture of the design of SPELEs is presented. The background of this design, which is based on interpretations of modern constructivist and social views of learning in the Internet context, is also presented. Based on this architecture a specific SPELE, designed for the learning of concepts related to Files and Peripheral Storage Devices (FPSD.), is demonstrated and its pilot evaluation study with real students is reported. The analysis of the data verifies the theoretical design of SPELEs, which consists of five parts: (a) organization of the content of a specific learning subject, (b) learning activities (c) learner activity space (d) learner assessment, and (e) learner communication. The analysis of the data also gives evidence for future improvements of the specific SPELE mentioned above.*

# Introduction

General Purpose E-Learning Environments (GPELEs) are designed to support the learning of all learning subjects. Some well-known examples of GPELEs are: WebCT (www.webct.com), Learning Space (www.lotus.com/ home.nsf/welcome/learspace) and CENTRA-Symposium (www.Centra.com/products/ symposium), and the like. A number of studies have shown the positive learning results achieved by learners in the context of these environments. Despite this fact, these environments do not provide the learners with opportunities to use specific tools and representation systems to support active and constructive participation for the learning of each specific subject. Moreover, GPELEs do not provide tools and representation systems that take into account specific research studies illuminating the learners' individual differences regarding a specific subject. As a result, in the context of GPELEs, the learners' individual learning differences are not fully treated.

It is worth mentioning that the learning process is closely related to each learning subject as well as to learners' individual learning differences. These differences are also firmly dependent on each learning subject, as it has been reported by the relevant scientific communities. Based on the above, the value of Special Purpose E-Learning Environments (SPELEs) designed for the learning of a specific group of concepts within a specific knowledge domain is obvious. Furthermore, the concept of SPELEs is well situated in the context of modern constructivist and social theories of learning, where the learning process is viewed as an active, subjective, and constructive activity in a context rich in computer tools (Noss & Hoyles, 1996; von Glasersfeld, 1987; Vygotsky, 1978).

In the context of these theories, a new general architecture for the design of SPELEs has been constructed. This architecture emphasizes learning in a context supporting: (a) the learning of essential aspects of each learning subject (von Glasersfeld, 1987), (b) open real-life learning activities (CTGV, 1992; Jonassen, 1991, 2000; Liu & Hsiao, 2002), (c) the learners' individual differences as they emerged from relevant research studies (Kordaki & Potari, 2002), (d) content presentation in multiple hyperlinked representation systems organized by using the learning activity as the basic structure-unit (Jonassen, 2000), (e) active learning using a variety of representation systems and computer tools (Kaput, 1994), as well as experimentation with representations and tools handling primary sources of data and using hands-on experience (NCREL, 2005), (f) multiple ways of assessment (von Glasersfeld, 1987), including the participation in appropriately designed games, (g) appropriate intrinsic and extrinsic feedback for self correction (Papert, 1980), (h) multiple ways of communication (Harasim, Hiltz, Teles, & Turoff, 1995), and (i) real-life operations and objects used as metaphor-representation systems of computer operations and objects acknowledged. It is worth mentioning that SPELEs based on such an architecture have yet not been reported.

The proposed architecture was used for the design of a SPELE for the learning of concepts related to Files and Peripheral Storage Devices (FPSD) for secondary-level education students. These concepts are viewed as essential for elementary computer learning. Such an e-learning environment for the concepts mentioned above has also not yet been reported.

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