Chapter 1

E-Learning

1.1 Introduction to E-Learning

The term *e-learning* refers to a number of different methods, concepts and techniques. It is therefore difficult to confine the term sharply. Thus, in literature, there are different definitions of what e-learning is and what it is supposed to be. Rosenberg (2006) defines e-learning as follows:

> **E-learning** is the use of Internet technologies to create and deliver a rich learning environment that includes a broad array of instruction and information resources and solutions, the goal of which is to enhance individual and organizational performance.

Rosenberg defines e-learning purely by terms of instruction and information resources. Further, *the use of Internet technologies* is seen as a necessary condition for e-learning. The definition does not take into account educational software.

Richert (2007) critises the definition of Rosenberg because she sees no reason for such equality of terms. She constitutes her view with the fact that electronic (learning) applications are not limited to the Internet. Richert (2007) defines e-learning as:

> Unter E-learning wird das computergestützte Lernen (vorwiegend von Einzelpersonen) mit hypertextbasierten, multimedialen, interaktiven Systemen verstanden, das zeit- und ortsunabhängig sowohl online als auch offline erfolgen kann.

in English:

> E-learning is defined as computer-aided learning (mainly by individuals) with hypertext- and multimedia-based interactive systems. The learning process can take place independent of time and location both online and offline.

It is important to note that the term is broader than the definition of Rosenberg, but is restricted to *learning systems*. That means concretely that electronic media like dictionaries may be included in e-learning systems as a tool, however, they can only form a part of a more general e-learning environment. Electronic media itself is not necessarily understood as e-learning system.

1.2 Classification of E-Learning Systems

E-learning systems can be classified by their their degree of freedom for user interaction. On one end of the scale there are *Drill-and-Practice* programs that do not allow for freedom of interaction. On the other end there are interactive programs allowing the user to interact and control the application. Judged by the definition of Richert this classification does not seem very suitable (Richert 2007).

Another possiblility to classify e-learning systems is the the kind of storage media used. This classification allows for a distinction between *online* and *offline* e-learning systems. *Offline systems* are those systems that are offered on passive storage media like floppy disk, CD-ROM. Offline systems are usually called *Computer Based Training* (CBS) systems. *Online systems* on the other hand are web server based systems that fall under the category of *Web Based Training* (WBS) systems (Richert 2007).

Additionally, Richert (2007) defines *hybrid systems* that are CBT systems but use the Internet as a means of communication with other learners. Table 1.1 shows the classification of e-learning systems after (Richert 2007).

		Using the WWW as storage medium	
		Yes	No
Using the Internet for communication	No	WBT	CBT
	Yes	Learning platforms	Hybrid CBT

Table 1.1: Classification of e-learning systems

1.3 Technical Context of E-Learning

1.3.1 Multimedia Systems

The term *Multimedia* has several definitions. Simple versions of multimedia definitions state that multimedia refers to a combination of different forms of information from several sources. Those forms can contain textual information, graphic, video and audio. With a broad definition of that kind any television news report could be regarded as multimedia. Richert (2007) understands *multimedia* more holistically than that. She sees multimedia as a technological concept that allows for the interaction of a user and a multiple media system. More than one sensorial modality should be should be presented by the system.

1.3.2 Classification of Interactivity

Interactivity can be defined in several steps. The concept of *interaction* serves as a basis for the classification, because in a sociological sense there can, by definition, be no mutual interference between man and machine. Interactivity in the sense of interaction comprises the ability to access and control different functionalities of a software system (Richert 2007).

Six classes of interactivity can be described. They differ by their degree of interaction between the user and a software system. The gamut of interactivity is used to evaluate e-learning applications:

1. **View and absorb objects**
   The hypermedial components can be viewed and played by the user. The user can not further influence the components in any way.

2. **View and absorb multiple displays**
   Program components offer more than one display. For instance, a user could click on a picture and be shown a different one. No modification of components is possible.

3. **Varying the form of representation**
   On this level, users can gain the feeling they could actively influence the multimedia components. They can scale objects or view them from different perspectives. Users can influence the form of representation but not the content.

4. **Changing the content of a component - parameter or data variation**
   Contents of a multimedia component are generated by the user. Users can input data or text. They can not change films or pictures. A usage example of that type could be the selection methods of statistics programs. Users can modify objects and the program yields different results.

5. **Generating objects or the content of a representation**
   This mode of interaction is reached by applications that offer tools to create and change content. For example visualise thoughts with mindmaps, or render new forms and models.

6. **Constructive and manipulative actions through situation-dependent feedback**
   On this level of interaction symbols can be manipulated and the result of the interpretation can be interpreted by the program. That allows for the generatoin of useful and context-sensitive feedback. User input can be evaluated by the application.

The gamut is described after (Richert 2007).

1.4 Pedagogical Context of E-Learning

The pedagogical context of e-learning is a crucial part of any e-learning environment. The learning targets need to be defined and a conceptual design of a software needs to be based on those.

1.4.1 Learning

The term *learning* is of a complex nature. A definition of learning is therefore never sharply confined. The definition of *learning* by Lefrancois (1994) shows how broad the term can be percieved:

> *Lernen umfasst alle Verhaltensänderungen, die aufgrund von Erfahrungen zustandekommen.*

In English:

> Learning compasses all changes in behaviour that are based on experience.

The changes in behaviour include those processes that do not aim at acquiring information, but also those changes in behaviour of an unknown cause (Lefrancois 1994). According to (Richert 2007), this means the acquisition of competences of different kinds.

1.4.1.1 Educational Objectives

1.4.1.2 Self-Driven Learning

1.4.2 Intelligent Tutorial Systems

s 71KI, s72 tutorensysteme bei richert

1.5 E-Learning of Languages

strengthening of competences (s.96) richert: s. 95 97ff

1.6 E-Learning of Japanese Script

1.6.1 Conceptual Issues for E-Learning of Kanji

1.6.2 Classification of a Kanji Teaching Application

computer assisted language learning: (Bailey and Meurers 2008)

(Zimmer 2009)Bildung durch e-learning. allgemeine aspekte (Stahlmann 2004) spezielle aspekte bezueglich han-trainer pro (Hettinger 2008) wie kann man e-learning in der schule einsetzen? e-learning: grundlagen, modelle, perspektiven

(Richert 2007) breite einfuehrung in e-learning theorie.

(Seel and Ifenthaler 2009) sehr breite allgemeine einfuehrung ins online-lernen (Ivašin 2009)kritik an der technischen dominanz in elektronisch unterstuetzten lern- und lehrprozessen.

(Stark et al. 2002) comparison of two e-learning apps.

References

Bailey, S. and D. Meurers (2008). Diagnosing Meaning Errors in Short Answers to Reading Comprehension Questions. In *EANL '08: Proceedings of the Third Workshop on Innovative Use of NLP for Building Educational Applications*, Morristown, NJ, USA, pp. 107--115. Association for Computational Linguistics.

Hettinger, J. (2008). *E-Learning in der Schule (in German)*. Munich, Germany: kopaed Verlag.

Ivašin, M. (2009). Lernen und Technologie (in German). In B. Mikuszeit and U. Szudra (Eds.), *Multimedia und ethische Bildung*, Chapter 5.5, pp. 635--648. Frankfurt am Main, Germany: Peter Lang.

Lefrancois, G. R. (1994). *Psychologie des Lernens (in German)*. Heidelberg, Germany: Springer.

Richert, A. S. (2007, Dec). *Einfluss von Lernbiografien und subjektiven Theorien auf selbst gesteuertes Einzellernen mittels E-Learning am Beispiel Fremdsprachenlernen (in German)*. Ph. D. thesis, RWTH Aachen, Aachen. Manuscript committee: Prof. Dr. phil. Rudolf Beier, Prof. Dr. phil. Uwe Michelsen.

Rosenberg, M. J. (2006). *Beyond E-Learning. Approaches and Technologies to Enhance Organizational Knowledge, Learning and Performance*. San Francisco, USA: Pfeiffer.

Seel, N. M. and D. Ifenthaler (2009). *Online lernen und lehren (in German)*. Munich, Germany: Reinhardt UTB.

Stahlmann, R. (2004). Didaktische, inhaltliche und funktionelle Optimierung einer selbst entwickelten Chinesischlernsoftware (in German). Master's thesis, Offenburg University of Applied Sciences, Offenburg, Germany. Manuscript committee: Prof. Dr. Roland Riempp (supervisor), Prof. Dr. Thomas Breyer-Mayländer.

Stark, C., K. J. Schmidt, L. Shafer, and M. Crawford (2002). Creating E-Learning Programs: A Comparison of Two Programs. *Frontiers in Education, Annual 1*, T4E1--6.

Zimmer, G. (2009). Bildung mit E-Learning (in German). In B. Mikuszeit and U. Szudra (Eds.), *Multimedia und ethische Bildung*, Chapter 1.3, pp. 61--92. Frankfurt am Main, Germany: Peter Lang.

Document created on Wednesday 17th February, 2010 at 23:08