E-learning pedagogy: The reveal of value adding learning processes. Definitions and Implications for dynamic learning content delivery

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Abstract

E-learning seems to suffer from the heritage of many "e-" things that in the last decade formulate the new business environment. The overestimation of the role of technology causes a misunderstanding concerning the key issues in e-learning (Lytras and Pouloudi 2001). Our approach for e-learning recognizes three dimensions as the critical pillars that have a direct impact in e-learning performance: E-learning pedagogy (Lytras and Doukidis 2001), (Lytras and Doukidis 2000) , knowledge management (Lytras and Doukidis 2000), (Lytras, Pouloudi et al. 2002), (Lytras, Pouloudi et al. 2002) and Application Integration. This paper focuses on E-learning pedagogy. Our intention is to provide a thoroughly analysis of parameters that justify a pedagogical strategy for e-leanring exploitation. The ultimate objective is to investigate the role of specific learning process in the exploitation of learning content and in the support of dynamic unique learning experiences.

1. Introduction

The case of human resources management in business environments is of vital importance for the establishment of business strategy (Carter and Scarbrough 2001). Knowledge exploitation and learning capability (Ryan 1995), seem to be two integrated aspects of the same phenomenon: The establishment of continuous improvement flexible mechanisms for the exploitation of the intellectual capital in business and academics environments (Coulson 2000). In this context where the investigation of the performance of the undertaken effort is of critical importance for the justification of investments, the detailed analysis of success factors in e-learning is of critical importance.The Multidimensional Dynamic E-learning Model (MDL model) (Lytras and Doukidis 2000), (Lytras and Odman 2001), summarizes a hypothesis, that in e-learning the overall performance can be overviewed in the mass of a cube which boundaries are determined by three parameters. The e-learning pedagogy dimension, the Knowledge Management sophistication and the application integration dimension.

The Multidimensional Dynamic e-Learning (MDL) Model is based on three complementary dimensions:⊡ The Knowledge Management dimension ⊡ The e-Learning dimension ⊡ The application integration dimension. Each of these describe in synopsis detailed considerations that confront the e-cooperation platforms such as knowledge management systems with embedded e-learning pedagogy and capacity of dynamic integration with other crucial business applications. To be more specific we will use three explanations for the three dimensions of MDL model. The **Knowledge Management Sophistication** summarizes the ability of the e-learning platform to manage learning content in various formats, to re-use learning modules and to support knowledge management processes such as knowledge creation, knowledge codification, knowledge transformation and knowledge diffusion. The **E-Learning Dimension** stands for the ability of an e-learning system to construct effective learning mechanisms and learning processes that support the achievement of different educational goals. With no doubt this dimension incorporates issues like learning styles, learning needs, learning templates as well as learning specification settings. The **Application Integration Dimension** summarizes for the e-learning platforms the capacity of collaboration with other business applications in order to obtain learning content from real business operations. This dimension seems to be the less detected on the common platforms and this causes a number of gaps for the effective implementation of cooperation systems. The critical issue of insufficient content in many situations is due to the inability of the organizations to establish a knowledge generation mechanism through the operation of information systems that support the most important business processes. Our paper is trying to explain further the e-learning pedagogy dimension. The detailed analysis of each dimension formulates an analytical tool where the delivered value in an e-learning collaboration can be represented in the surface of the cube.

2. Describing methods for Learning Value classification

One of the major obstacles in e-learning is the static approaches to the delivery of learning content. If we assume that in an e-learning system we can obtain sufficient content then the key question is how do you diffuse it to learners and how can we establish effective motivation mechanisms?

For this purpose we decided to analyze the propositions of well-known researchers such as (Bloom and Krathwohl 1984), (Shuell 1992). The key idea of their work seems to has a direct impact in every implementation that refers to learning. But let start our syllogism concerning their relevance of their propositions in learning. The traditional approach in e-learning is mainly focused on the development of session and their delivery through internet usually through a Learning Management System. Unfortunately these platforms do not prove their learning capability. A hypothesis whenever we refer to information systems is that the users of systems require the fulfillment of several needs and potentially this fulfillment is based on a value realization. In other words transforming this general statement in e-learning context we can claim that an e-learner demands the reveal of value components when he/she interacts with the e-learning system. This value realization can be investigated in different level: Technology, content, functionalities, processes, communication etc. But irrelevant of the level, the key

understanding is that e-learning is mainly a learning phenomenon. From this perspective the value that the engagement of information and communication technologies promote in e-elearning has primarily to be realized through the learning sophistication of the whole system. The cataloguing of learning objects in a database (which is several packages such as WebCT is not as simple) does not mean that learning is guaranteed.

The main this of the e-learning is the specification of engagement mechanisms with the learning content. If we establish capabilities that will set an environment where learners feel motivated and are engaged in learning content exploration then their perception of value is increased. In this direction three concepts not novel , but quiet interesting are putting in detail analysis: Namely educational objectives, learning processes and learning functions.

2.1 Bloom's & Shuell' s Approaches

The limited space of this paper do not give as the opportunity to discuss in detail two approaches that have for many supported the educational design. The development of a classification framework for writing educational objectives was the main contribution of Bllom in three domains Cognitive, Affective and Psychomotor. Especially in the cognitive domain the hierarchy opf educational goals incorporates: **Knowledge, Comprehension , Application , Analysis , Synthesis.** The taxonomy is hierarchical in the meaning that levels increase in difficulty and sophistication as well as cumulative since each level is based on previous levels or it assumes them as cornerstones in a step b step process that promotes the achievement of well defined objectives. Additionally the 6 levels can be used as an investigation basis, which promotes the learning performance and the highest possible degree of learning content exploitation. Especially in an e-learning environment a such starting point is very crucial. The dispersed learning objects can be packaged using a value adding proposition through learning processes with specific life cycles overstepping the uncertain learning outcomes in the traditional approach where a hierarchical structure of linked modules sets a static learning scenario. The combination of different learning processes and the justified enrichment with metadat a of the various learning objects in order to support different learning processes seems to be an effective knowledge and learning management mechanism. . More over if we accept this scalable qualitative distinction of learning processes then we can un derstand why the attachment of metadata admit personalized learning since each learner could exploit learning objects in the basis of the selection of specific learning processes. The cognitive level of learners in this way, becomes the value driver for increased learning performance. Shuell identified a set of psychological processes, such as raising attention, expectations and motivation, activating prior knowledge and perform monitoring, that foster effective learning in the student. The perception of t he learning function as "*an attribute of the learning material in a specific context"* is highlighting the purpose of our research in e-learning. If we can justify several learning processes that are based on the research findings of Bloom and Shuell then t he context for the exploitation of the learning content is secured. In this case for each piece of learning material the author or the knowledge provider has to state the learning processes it serves for the various learners. The list of the 12 learning functions determined by Shuell is: Expectations, Motivation, Prior knowledge activation, Attention, Encoding, Comparison, Hypothesis Generation, Repetition, Feedback, Evaluation, Monitoring, Combination, Integration, Synthesis

2.2 The MDL value proposition for e-learning pedagogy

The contributions of Shuell & Bloom propositions facilitate our research. The integration of their approaches can provide a value-oriented approach concerning the delivery of learning content. The distinction of different educational goals and learning functions that promote a goal-oriented delivery of content promotes a dynamic parameterization in an e-learning environment. The dual concern of Shuell model, the fact that the specified learning functions can be utilized both by learners or educators influences and our approach: In an e-learning environment the content is provided by authors and is exploited by learners. But the packaging mechanism of content has to based in metadata that promote the dynamic nature of learning content exploitation. If we try to integrate the main ideas that underlie in the two approaches (Bloom, Shuell) , then we have to admit that there is a qualitative distinction of learning performance which is promoted through specific functions or processes that prerequisite different cognitive skills and promote different value to learners. From this perspective the key issue of how to organize and package the learning content and how to engage learners in an e-learning environment can be derive sophistication through the establishment of dynamic learning processes. The combination of learning processes that have specific life cycle set the context for learning scenarios. The advantages of this approach is that if we specify metadata that support more than on e learning process then this increases the exploitation capabilities of a learning object and promote a personalized learning environment. In our model can be added more learning processes if we model them. The underlying logic is that the learning object is packaged through its adaptability to the context of specific learning processes. In our research approach we have investigate 9 learning processes (Lytras, Pouloudi et al. 2002) , and we propose them as the basic value carrier in e-learning environments. These learning processes do not demand a magisterial role but set a base for further exploitation. Namely these learning processes are: **Presentation, Analysis, Synthesis, Evaluation, Reasoning, Explanation, Relation, Problem Solving, Cdlaboration.**

3. Detailed presentation of the proposed e-learning Pedagogy scaling

Our basic syllogism is that e-learning performance is directly related to learning processes, which are value carriers for the learners. The first implication is the requirement to model each learning process and consequently to specify metadata for each process in order the linguistic concept of learning process to get empower from descriptive information that can be

promoted to learners using ICTs. The ultimate objective is the understanding that reusability of learning resources is not panacea not even a promise for higher learning value except a number of metadata justifies the reusability in terms of diffused value.

An initial statement is that the value in each process is not objective but subjective since each learner pays different importance to processes according to his cognitive level and previous experiences. More over the life cycle of each process has to be analyzed from the perspective of learners and authors. The distinction of several phases does not assume a sequential flow of tasks but rather an indissoluble whole of integrated parts. In the next pages are promotes through tabular synopsis the life cycles and the implications of Shuell and Bloom's work in our research.

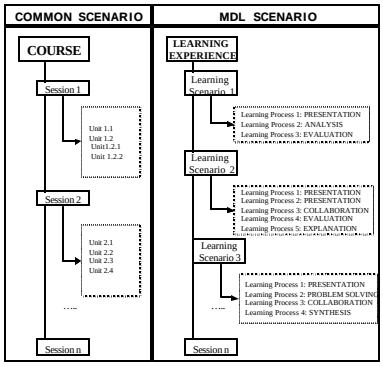

Figure 1. The proposed revision in e-learning content delivery method through value adding learning processes

4. Conclusions

Our approach is setting a context for further exploitation. With no doubt the current situation in e-learning market does not represent the fascinating issue of the incorporation of information and communication technologies in education. Many people use the e-learning term and presuppose the presence of a PowerPoint presentation accompanied with audio as the technological infrastructure for e-learning realization. The MDL framework is being evaluated for more than two year and the findings are very promising. The achievement of higher student satisfaction is only one of the key findings. Finally we have to say that this model is also very demanding. It's realization requires a lot more efforts from both academics and knowledge providers that seem to forget the nature of learning when they prepare learning material. For more information about our research unit you can visit our web site (www.eltrun.aueb.gr) . For comments concerning this paper please send an e-mail to the following address (mdl@aueb.gr).

		MDL Learning Processes								
		Presentation	Synthesis	Analysis	Evaluation	Reasoning	Problem Solving	Collaboration	Explanation	Relation
T. Shuell Learning Functions	Expectations	?	?	?	?	?	?	?	?	?
	Motivation	?	?	?	?	?	?	?	?	?
	Prior knowledge activation	?	?	?	?	?	?	?	?	?
	Attention	?	?	?	?	?	?	?	?	?
	Encoding	?	?	?	?	?	?	?	?	?
	Comparison		?	?	?	?	?		?	?
	Hypothesis Generation		?	?	?	?	?	?	?	?
	Repetition	?	?	?	?	?	?	?	?	?
	Feedback	?	?	?	?	?	?	?	?	?
	Evaluation	?	?	?	?	?	?	?	?	?
	Monitoring	?	? ?	? ?	? ?	? ?	? ?	? ?	? ?	? ?
	Combination, Integration, Synthesis		?	?	?	?	?		?	?
Bloom' s Taxonomy	Knowledge	?	?	?	?	?	?	?	?	?
	Comprehension	?	? ?	? ?	? ?	? ?	? ?	?	? ?	? ?
	Application			?	?	?	?		?	?
	Analysis			? ?	? ?	? ?	? ?	?	? ?	?
	Synthesis		? ?	? ?	? ?	? ?	? ?	?	? ?	?
	Evaluation		? ?	? ?	? ?	? ?	? ?		? ?	? ?

?

? : Learning Process is influenced by / can support	? : Metadata Specific in Each Process
? : Metadata of General Purpose	: Learning Scenario

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