

A SURVEY OF EUROPEAN COMMISSION ADAPTIVE AND PERSONALIZED E-LEARNING PROJECTS

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ABSTRACT

The Information Society Technologies' (IST) priority is to improve the efficiency and cost-effectiveness of learning, for individuals and organizations, independent of time, place and pace, through the development of *open systems and services in support of ubiquitous, experiential and contextualised teaming and virtual collaborative teaming communities*. It also combines advanced cognitive and knowledge-based approaches with new media, and aims at demonstrating next-generation learning solutions.

Open Platforms and Tools for Personalized Learning Projects funded by the European Commission aim to develop tools and systems that enable learning providers to implement and maintain integrated learning services, based particularly on re-usable learning objects. These projects are generally not developing specific learning programs, but are engaged in designing a platform or schema upon which these learning programs may be used.

In this work, we survey on the projects and their research and developments to convey an understanding on recent state of the art on these issues. Among these projects, we focus on the projects 3DE, EASEL and KOD (European Commission 5th Framework programme projects) which are dealing with adaptive and personalized e-learning. Also, within personalization concept in e-learning, the trends on *learning styles* is analyzed through these projects.

Key words: IST, European Commission 5th Framework Programme Projects, 3DE, EASEL, KOD, Adaptive e-Learning, Personalized e-Learning, Learning Styles.

INTRODUCTION

The major goal of personalized e-Learning is to “provide e-learning content, activities and collaboration, adapted to the specific needs and influenced by specific preferences of the student, based on the sound pedagogic strategies” (conlan, ppt). E-learning's importance comes from its feature of combining technology together with pedagogy. The effective e-learning could be achieved by combining. The non-intrusive technologies together with the appropriate pedagogies makes e-learning be very effective.

For an effective e-learning, other two crucial things that an e-learning system should are personalization and adaptivity of the e-learning system. The basic information for personalization of the e-learning system comes from the individual features of the learner. For example, the cognitive and learning style of the learner, his/her preferences and learning culture, prior knowledge state of the learner are among these features that help the e-learning system to store the profile specific to that learner. As a result, we can say that the learning profile of the learner is determined first and then with the help of the information obtained from the profiler the specific learning material, with a specific learning path, provided by the personalized system.

Adaptivity of a system means that the personalization of the system for each learner could be done for any user, the learner in this case, using the e-learning system. Together, the adaptivity and personalization enables an e-learning system to reach many users in an effective way.

In education, as well as in e-learning, the most important thing is to teach a subject to the learner effectively in a very short time. Because of this the instructor must choose the learning material, learning object, very carefully. In e-learning environment the instructional designers do this. Similarly, The Information Society Technologies' (IST) priority is to improve the efficiency and cost-effectiveness of learning, for individuals and organizations, independent of time, place and pace, through the development of *open systems and services in support of ubiquitous, experiential and contextualised teaming and virtual collaborative teaming communities*. It also combines advanced cognitive and knowledge-based approaches with new media, and aims at demonstrating next-generation learning solutions.

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PROJECTS

The 3DE, EASEL and KOD are research projects within the European Union IST 5th Framework Programme. Among these the 3De project aims to define, design, and build a development methodology and environment for Interactive Educational Multimedia to make easy the design, building, and delivery of courses with higher effectiveness. In addition, the 3DE project wants to make improvements in learner-centered pedagogical design that is customised for the needs of each learner. Moreover, achievement of cost reduction by standardization, reuse and application of design engineering methodologies is another goal of the project. On the other hand one major goal of the EASEL project is to extend existing interoperability standards to cover also adaptive features of learning resources, i.e. in the project one of the goals is to extend educational metadata standards (e.g. IMS Metadata) such that they can describe adaptive features of electronic learning resources. The project tried to combine state-of-the-art research into high quality adaptive content with a sound business model for the exchange and re-use of online content. The resulting course offerings would be capable of being used across many learning management systems, driving down the cost of online learning provision. Lastly, The KOD project addresses the up rising and pervasive needs originating in contemporary Information Society for the effective and efficient distribution of electronic publishing information in order to favour life long learning and knowledge transfer experiences for the web users. The idea behind the KOD system is the generation of personal learning paths, generated and updated on a user basis, which is constantly monitored and profiled. As a result we can say that the KOD project aims to address a number of different categories of users and market actors involved in the e-Learning business framework, including *e-Learning assets publishers, e-Learning platform providers, e-Learning service providers*.

The outcomes of the projects are: In the 3DE project the cost reduction and some educational benefits such as measurement of the ratio among the time spent on the lesson and the results of the learning process are achieved. Also, the awareness of self for the learner increased and collaborative learning abilities of the learner developed. On the other hand in the EASEL project a service-driven, standards-based approach were used successfully. Moreover, metadata was used and extended to describe e-learning resources and services and personalized e-learning services successfully integrated within traditional e-learning courses. Finally, in the KOD project the technical solution is integrated with emerging international specifications such as IMS, ADL SCORM, IEEE, by means of advanced web technologies. Also, KOD “Knowledge Packaging” format extended emerging international e-learning specs and enabling them to “publish” all constituents and determinants of the KOD personal learning model like raw assets, user profiles, testing points and metadata. We can say that KOD solution is open, reusable, and interoperable.

Although the projects outcomes indicate that there is a considerable in adaptive and personalized e-learning systems we should mention about ongoing issues on these projects. For instance, in 3DE project, one of the issues is that only Kolb-McCarthy learning inventory was used in determining the learning style of the learner. Beside this there is limited evidence on the effectiveness of this as a basis for personalization. If we mention about the issues on EASEL we can say that writing metadata is very important and requires standards, schemas, mapping, vocabulary, ontologies and language. Also, in EASEL it another thing that should be taken into consideration is that the teachers are not course designers. Lastly, the issues on KOD project are that “Knowledge Packaging” could be used to interchange models, but the specifications like for Simple Sequencing do not mature enough. In addition, learning environments are “compliant” with specifications and unfortunately compliancy does not guarantee successful interchange.

CONCLUSION

Based on the past experience on e-learning projects we can conclude that e-learning is a combination of technology and pedagogy, which also makes the e-learning system personalized. In addition, the personalization achieved for each learner makes the system adaptive. Together with these two,

personalization and adaptivity, the e-learning system provides a very effective learning environment to each user in a very short time.

Finally, we could say that the previous adaptive and personalized e-learning projects, some of which are 3DE, EASEL and KOD, that are analyzed in this paper, taught us that teachers are not course developers. In addition, integrating pedagogy to e-learning in the right way is very important. And dealing with the standards is not as easy in practice, as it is in theory. Similarly, metadata is a concept that has to be investigated in detail.

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