

# **ELEARNING FOR HETEROGENEOUS GROUPS**

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## **Abstract**

Today's learning systems have a fixed architecture, which make customizing of requirements most difficult. This restriction is today valid as well as for the CBT and LMS because the systems use fixed products e.g. content for the learning and on line exams for the evaluation of students. This "lost" integration causes not qualified imparting of content. It is necessary to define guidelines for eLearning applications from identification of user level to adaptation of user requirements, depending on time and situation and automatically of content for the user requirements. Therefore many factors have to be compared and matched with user requirements. Additionally, web based systems require user specified information and security aspects too. The combination of all these factors is important for the improvement of user acceptance level and results of eLearning application.

## **Keywords**

eLearning, education, CBT, WBT, Content Management, On Line Testing

## **Introduction**

User acceptance for eLearning systems depends on many factors. The most important decision factors are among other things user knowledge level, customizing of content and parametrization of content and last but not least test types for the analysis and assignment of questions to user.

In this paper will be discussed a concept for elearning applications. It will be analysed how eLearning can be used for satisfying user requirements and how user requirements can be defined neutral and without external influences of relations between learning system and users.

The second section in this work considers the customizing of user requirements. Depending on different user knowledge levels we can not offer a standard content in the area of eLearning because of non homogenous user groups e.g. mixed student or employee groups characterized with different basis levels.

The next steps present a database analysis for the test environment for different test structures and the relation between content and test results.

The last section describes the prototype and application area.

The concept stated in this contribution is significant for the user requirements and self assessment process within the learning period.

## **Concept**

The concept presented in this contribution, is called ADLOC (Advanced Learning Operating Concept) and contains a start exam for the identification of user knowledge level and assignment of needed course content. Depending on user knowledge level must be assigned exact content, which needs particular learning contents. A standard content can not be optimal used because relations lost between the lections or section. On the other hand it is required defining of learning units.

The concept requires a combination of full automation with selection of question and assessment for content selection. This expects an exact shaped identification of content for user requirements and additional cooperation of pre exam tools, content management and learn success tool.

The usage of the concept will be tested for different knowledge levels of students in practice and at university. For the first application will be used the lecture "the database system and SQL".

The first section will explain concept and relations between different parts of tools. In the second part will be discuss the relations between pre test questions, content management and assignment system. It will be presented the meta model of content management system and connection of weighting and assignment system and exam results. The assignment has a full automatic functionality and can be customized from the course manager included the question database mapping and identification of user requirements.

Currently, this prototype will be implemented for optimal requirements covering and reuse of existing lectures.

## **User Requirements and on line testing environment**

The testing environment has different goals: e.g. scoring of knowledge, motivation for learning, rating of knowledge, evaluation of the student's understanding of each concept, provision of feedback to the student concerning his/her performance during the evaluation, and assessment of the student's complete understanding of each concept. The combination of eLearning content and testing environment can be used for matching user requirements and content assignment, where the following requirement have to be considered:

- user knowledge level
- goal of eLearning
- content structure
- time and cost of application
- ROI value of application

For this reason we can use the web based training and off line training, where this concept can be used for both types of eLearning. Additionally, an online portal can be added for web based eLearning for the improvement of the results and functionalities.

For the testing parts of the concept can be considered the following characteristics:

- evaluation of user knowledge
- tracking of user interaction
- evaluation of user performance results

- tutorial connectivity with user assessment
- implementation issues
- security issues
- user feedback about session
- user tracking

In the test concept for ADLOC have been used the following question types:

- Multiple Choice and/or Multiple Response
- True/False and/or Selection
- Short Answer
- Visual Identification
- Essay

For all test types was defined a random generator within the content database for defining all possible answers for a specific topic. This random generator enables for the user content based self assessment.

A description of the used question types can be seen in table 1.

<b>Question Type</b>	<b>Definition</b>
Multiple Choice	questions where the user is asked to select the correct/best answer (from a list of alternatives)
Multiple Response	questions where the user is asked to select a number of correct answers from a list
True/False	questions where the user is asked to evaluate the truthfulness of a statement
Selection	questions where the user answers by matching items from two related lists
Short Answer	Question which can be answered by entering free selectable word(s), short phrase(s) or number(s)
Visual Identification	questions which can be answered by moving a marker on a section of the screen
Essay	Question which can be answered by entering free text (paragraphs)

Table 1 - Summary of used question types in ADLOC

The configurator uses a concept for the connection between content database and on line test environment. Based on user requirements the configurator matches the specifications (skills, personal preferences...) which are stored in the user profiles with the meta data describing the learning objects.

The mapping is based on defined configuration algorithms for the course assembly. As a result only the necessary learning objects are selected and assembled to a customized eLearning course. The filter algorithms depend on the customization technique. Content based filtering matches the user data with the content metadata according to filter rules or keywords. Collaborative based filtering compares the user profiles of all users and creates user segments with similar skills and preferences. As both customization techniques have their strengths

and weaknesses we suggest in our model a combination of both techniques to optimize the performance of the system.

### **Content**

On the basis of demand of concept the content must be defined with min. content unit for the optimal connectivity and knowledge relations between content unit. This KU (Knowledge Unit) contains at least the following parts:

Text

Pictures

Audio

### **Conclusion**

The ADLOC Concept is based on a two years project at University in Austria. The first implementation steps have been finished. The integration of different content origins is in progress. The difficulty in this area creates the standard of eLearning content. For ready content which can be bought the matching of user requirements and content is difficult.

For the second type of content which we prepare ourselves for our lectures at university we can use the ADLOC meta model. The ADLOC Concept is improved continuously, especially the meta model and ADLOC main concept. As a first step it is planned to use the concept in different universities in Austria.

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