Implementation of information technology for contents management in an E-learning model

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Abstract — **The main focus of this work is put on a proposed model system for contents management implemented in an E-learning model. The role of this process has a key function in the E-learning model. This paper presents the most important cooperation aspects, maintenance of courses and tests, mailing system, as well as assistance to different communication languages.**

Key words — **Information technologies, computer application development, E-learning.**

I. INTRODUCTION

IN the system of an E-learning, it is extremely important that the users cooperate with each other in the course of educational process, exchanging in that way experience related to the content of test or course. This method of cooperation and communication assists the teacher in gaining insight into main problems of students and the process of knowledge acquisition, enabling the teacher to make his/her lectures more effective.

To this purpose, the proposed system uses Students' forum which is especially adjusted for functioning in dynamic conditions. Forum is based on the principle of different groups.

The users who belong to a particular group can input contents within the group. The other users cannot see the discussion contents unless they have joined that group. It is important to mention that the user can be a member of the several groups at the same time. Every time the teacher creates a new course, the new group has automatically been created.

Due to the system for internal classification of students, every student who has joined a particular educational event automatically becomes a member of the forum group connected to that event. This means that within one group teachers, students and even administrators can communicate and cooperate.

There is another public group on forum which can be accessed by all system users without previous joining to any of the events.
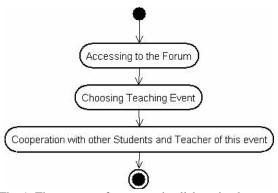

Fig. 1. The process of access and collaboration between users within one educational event

II. SYSTEM FOR EVENTS ORGANIZATION AND PROTECTION

In the process of organizing events for education, it is very important that their time periods are defined. In this system, it can be done in two ways:

• Arrangement of adjustment of course contents visibility

• Time period arrangement, by adjusting accessibility of the test in the determined time period.

In the procedure of course creating, the teacher is able to determine which course contents are visible and which are not. Also, in the process of tests creating, the teacher can define period in which the course can be accessed, i.e. when the particular course will become active and when not, figure 2.

Good organization of event within the system requires purposeful separation of different tasks and jobs. System of protection makes it possible by limiting the functions which various users (external and internal communication system) realize within and outside of different types of events (system for events classification) in the following way:

• Course contents protection

• Users' data protection

The rules of access to educational contents:

Guest– can access public events.

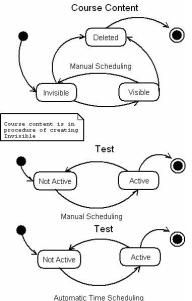Student – can access public, private and protected events.

Fig. 2. Events organization

The teacher is able to change courses contents, and in the case when he/she accesses the courses of other teacher, his/her rights are the same as those of a student.

Administrator can access all types of events, as well as users' data.

III. SYSTEM FOR SENDING E-MAILS BASED ON TEMPLATES

System for sending e-mails is directly connected to the system for external communication. In the presented model, all necessary tools for the teacher and administrator for creating and forwarding e –mails are provided.

Administrator can send e-mails both to lectures and to students, as shown in figure 3.

The teacher can send messages to students who have joined the educational events which that teacher organizes on principle: send message to one user or to all users on the list (figure 4).
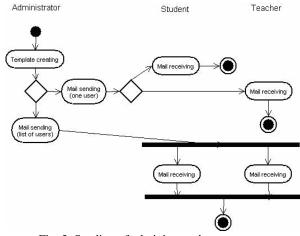

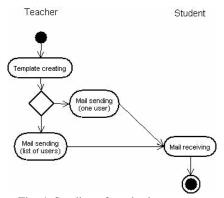Fig. 3. Sending of administrator's messages

Fig. 4. Sending of teacher's messages

IV. INSIGHT INTO STATISTICS

In the presented model, two statistical systems exist:
• Elementary – on the course level, and
• Systems for evaluation of tests effectiveness.

Elementary statistical system enables the course author to monitor the number of visits to his/her courses.

System for monitoring testes effectiveness is directly connected to the testing system and gives detained insight into tests results.

In the form of pre-testing, the system shows the knowledge of students before the course is organized and in the form of post-test the knowledge of students after the course. Naturally, during the course duration it is also possible to perform testing.

By comparing the level of students' knowledge in different periods, it is possible to estimate successfully both the success of the course as a whole and the success of its elements.

The following parameters are monitored by the system:
On the test level:
• Number of users per test
• How many times the users took the test.
• How many users passed the test
• How many users failed
• How many tests were not graded
• How many tests were not completed in given time
On the user level:
• How many times the user took the test
• How many times that user passed the test
• How many times that user failed the test
• How many times the result was not graded
• How many times the user did not complete the test in given time
On the question level:
• How many times the question was answered correctly
• How many times the question was answered incorrectly
• How many times the users did not answer the question.

Based on the afore mentioned information, it can be concluded that on the first level the system provides the results on the level of tests and students as a group, then it provides data on the level of student and finally it provides

data on test success on the basis of each actual question as a part of the test.

The results can indicate to the test author that particular questions were not well formulated and treated in the teaching material.

By using this system, as well as the system for cooperation and communication, the teacher can monitor the acquisition of the teaching material at every moment and for each student individually.

V. COURSE CONTENTS MANAGEMENT

The courses, as part of this system, are considered highly important. This system provides all the tools necessary for input and maintenance of contents.

On the first level the system provides tools for input and maintenance of the textual contents.

In order to improve the navigation through course contents, the system provides Content Menu. As an addition to this, the system provides the input of any type of content which, as an addition to the textual contents, serves for improving the success of teaching.

The additional contents can be placed within or outside of the course contents.

Outside of the part for maintenance and input of textual contents, addition for input of supplementary contents in the form of Attachment is provided, which will be available to the user in addition to the remaining course contents.

Course contents can be changed at any moment.

As an addition to the course contents, the system contains the system for input, maintenance and searching of unknown expressions.

VI. TESTS CONTENTS MANAGEMENT

One course can include several tests. Tests are very important in measuring the success of teaching. One test can contain several questions, and one question can have several answers.

As an addition to the textual contents, every test question and answer to the question can include the image.

The answers to questions are the typical system of selection among several offered possible answers. Adding up of points on the test is automated.

In the test creation process, the author adjusts the number of points for each question. In the creation process, the author is obliged to determine which answer is correct. After adjustment, the system will collect points for each individual user's session.

When the student enters the results and teacher enters all previously specified parameters, the student has the possibility to see the results for all the tests in which he/she participated, as shown in figure 5.

The system also offers the module for tests grading. After the student enters the answers, the test becomes available to the author for giving the final grade. The teacher will give the grade on the basis of standards belonging to the organization which performs grading. It is important to mention that various grading scales are valid in various countries.
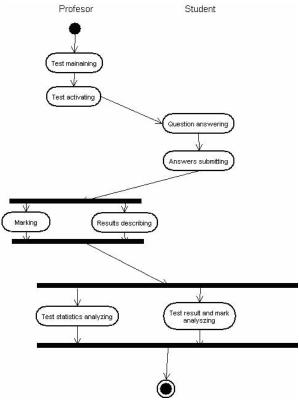

Fig. 5. The way of displaying test results

In order to make it possible for the student to see the test results, the author has the possibility to give a grade and to adjust the parameter which marks whether the student passed or not, as well as to give explanation of his/her grade.

These actions are important for two reasons:
- to inform the student on the result
- to make the statistics module work correctly

VII. THE SYSTEM FOR MULTILINGUAL SUPPORT

The presented system has the support for functioning in multilingual area. The system for multilingual support is related to the following arguments:
- Translation of system links
- Translation of the element on forms
- Translation of system messages

The integration of the new language into the system is performed easily, by opening the file which contains English as a basic language and by forming the new file with the translation into the desired language.

This module automatically recognizes the new file and integrates it into the complete system, which practically means that all the system elements, previously mentioned, were translated into the desired language.

Regarding the language integration it is important to mention that the official application language is English, and users accessing the system without registering (visitors-Guests) will see all previously specified elements in English. The procedure of adjusting the new language as a basic language is simple, but it is not automated.

The system for multilingual support starts functioning the moment the users successfully complete the registering procedure and select one of the offered languages within this system. The user is able to change the initially selected language u in the following access to the system, as shown in figure 6.
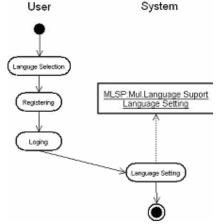

Fig. 6. The system for multilingual support

VIII. CONCLUSION

This paper is focused on the methods of teaching contents management with the particular emphasis on monitoring the success of teaching material acquisition by the learners. The paper proposes several concepts which, if further developed, could be considered a successful method of information technology implementation in the teaching process and method of timely reaction of teaching staff to the first signs of failure in the teaching process both from the aspect of tutored group as a whole and on the level of the individual within the group.

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