TECHNOLOGY OF OPEN DIGITAL RESOURCES USAGE IN THE E-LEARNING COURSE

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Abstract

The article deals with problems of using open digital resources in the e-learning course for interactive techniques of training. Methods and tools for forming the e-learning course using open sources; creation of interactive e-manuals with embedded multimedia, links to open information sources on the web; providing joint projects and involving a wide range of participants, communication, cooperation students through embedded widgets of social networks are substantiated.

Key words: e-learning course, widgets of social networks, embedded multimedia, video portal, Content Learning Management Systems

ТЕХНОЛОГИИ ИСПОЛЬЗОВАНИЯ ОТКРЫТЫХ ИНФОРМАЦИОННЫХ РЕСУРСОВ В ЭЛЕКТРОННОМ УЧЕБНОМ КУРСЕ

Аннотация

В статье рассматриваются проблемы использования открытых цифровых ресурсов в электронном учебном курсе целью обеспечения интерактивных методик обучения. Обоснованы методы и средства для формирования электронного курса с использованием открытых источников, создание интерактивных электронных учебников со встроенными мультимедиа ресурсами, ссылками открытые информационные источники в Интернете, обеспечение совместных проектов с привлечением более широкого круга участников, общение, сотрудничество студентов с помощью встроенных виджетов социальных сетей.

Ключевые слова: электронный учебный курс, виджеты социальных сетей, встроенные мультимедиа ресурсы, видео портал, система управления учебным контентом

Article

The conceptual basis of the Smart University is a large number of different scientific sources, and information and educational materials, multimedia resources (audio, graphics, video) that can be easily and quickly designed, assembled to a certain set, adjusted individually for each student, his/her need and peculiarity of educational activity and the level of educational achievements. To interest the modern student, who has access to a large number of high quality modern electronic materials that can be easily found in the Internet, by conventional text linear (non-multimedia) materials, only presented in electronic format, nowadays is almost impossible, especially informal training. We should create such resources that will integrate multimedia, text, feedback tools on the basis of specific teacher’s individual recommendations and external electronic resources that will meet individual needs and characteristics of the modern student-regular user of the Internet resources and social networks. Therefore, the integral components of information and educational environment of the modern university should be: institutional repository of knowledge with full-text electronic educational and scientific resources; educational portal, which provides electronic support of
all student’s learning activities for each discipline in the form of e-learning courses with individual tasks and distinct and clear evaluation criteria that are implemented with tools and method of forming assessment; video portal with multimedia resources for teaching and research activities; wiki portals as an environment to provide teamwork and collaboration; online services based on the use of Web 2.0 and Web 3.0 services and technologies, etc.

E-learning course is a didactic computer environment that contains classified material from the relevant scientific and practical field of knowledge that is combined by a single software shell, in which the following functional components are selected: information and navigation (meaningful connections, annotation and course structure, information, system of references, the searching system), informative (interrelated informative elements of the course—theory, practice, guidelines, additional materials, information resources, including electronic and open), diagnostic (formative assessment tools in the form of clear evaluation criteria for all types of student activity, including self-assessment and mutual assessment, evaluation not only of academic achievements of students, but also evaluation of formation of skills of the 21st century—to solve problems, work in team, communicate effectively and collaborate, etc., the testing system of current, intermediate and final control) [1].

Electronic courses should provide flexible learning of the students in an interactive learning environment, which allows him to adapt quickly to the environment, to study anywhere, anytime on the basis of free access to content all over the world. In our opinion, the electronic course for Smart Education can be represented as a certain scenario or trajectory of educational events how to work with electronic resources in the form of knowledge-map that leads to the achievement of learning effect and has the following properties:

- flexibility—enabling rapid resources editing and making adjustments in educational trajectory;
- availability of individual learning scenario, in other words, the possibility to draw up an individual educational program for each student from the set of training elements;
- integration of training elements with other open information resources;
- focusing on the learning needs of the student, the personification of content;
- interactivity of learning elements of the course, the maximum use of multimedia technologies (videocasts, animation, video tutorials, screencasts, etc.);
- feedback between the teacher and the student in the course;
- availability of training elements to ensure effective communication and cooperation of students between themselves and with the teacher, in particular based on the design technology [2];
- availability of game educational elements;
- providing communication through modern services of social networks [3].

Creation of e-learning courses usually is carried out with the help of Content Learning Management Systems. To create an effective e-learning course for Smart Education not only available electronic resources of information and educational environment of the University should be used, but also open external information resources and Web services that will serve as sources of educational and informational materials for electronic course and as means of communication and cooperation [4, 5] (Fig. 1).

Information and educational environment of the University should be focused on solving the problem of joint creation and use of academic knowledge for the needs of students and teaching staff of the university. On the one hand, the teacher by himself adds academic resources to the information and educational environment, such as video clips and video tutorials posted on educational video portal and on the other hand, he has the possibility to use available public resources for creating-learning course. So, to create an electronic course...
sufficient for the teacher to actualize material that is available from other sources, submit it in accordance with the above mentioned properties and criteria of evaluation of its quality, add the necessary training elements of the course according to the adopted structure and develop an individual learning scenario for each student, consider the individual evaluation criteria of educational achievements of students and developed skills of the 21st century.

Fig. 1. Sources of electronic course formation

Analysis of papers devoted to the creation and use of e-learning courses led to the conclusion that in the issue of the course structure they should be focused on the modular principle of its construction [6, 7, 8]. When structuring the content of educational subjects by the principle of training modules, each module should consist of interconnected theoretical, empirical and practical components of the content, each of which would carry out an independent function. Thus the educational discipline module is an information and didactic unit, in which the approach to structuring the whole into parts is unified. It has a complex structure that includes goal of its integral development, objectives, content and results with the corresponding system of formative assessment.

Furthermore, the structure of the e-course for Smart education should provide availability of:

- tools to build individual learning trajectory (prior surveys, questionnaires, tests, formative assessment tools, including check-lists and tables of evaluation criteria, etc.);
- multimedia presentations of summarizing character, video resources, interactive electronic manuals, external Web resources with multimedia theoretical material;
- links to external public resources including articles, conference proceedings, research materials, etc.;
- discussions on the forums, feedback with the teacher, webinars and other Web services;
- intermediate control elements during the lessons and formative evaluation instruments, final control in the form of control tasks and tests, element of reflection.
Each element of the training course must meet certain standards and be evaluated using criteria that are accepted at the level of educational institution [9]. Example of the course topic, created in the CLMS Moodle environment, presented on training and information portal NUBiP Ukraine (http://it.nubip.edu.ua/course/view.php?id=21).

Peculiarity of the new model electronic course is also the diversity of the theoretical learning resources presentation forms. Besides the theoretical material must be delivered by 60-70% in the multimedia interactive form, we also note the necessity to choose the method of material delivery, depending on the level of instruction. The theoretical material in electronic course can be delivered on the following four levels: phenomenological, analytical and synthetic, mathematical, axiomatic [10]. Phenomenological level is characterized by the descriptive way of presenting educational material. Therefore, these materials should be delivered in the form of multimedia presentations, interactive electronic manuals with graphics, multimedia and video elements. Analytic and synthetic level is characterized by the necessity of presenting of the theory of individual phenomena in naturally logical language that creates background for phenomena and processes forecast on a qualitative level. For this level animation resources with elements of cognitive graphics should be prepared that will be able to demonstrate the nature of the phenomenon and its dynamic changes. Video tutorials with explanation and demonstration of the logic of the processes as well as screen casts will be also effective. The mathematical level is characterized by the use of mathematical tools for modeling, theorem proving, examples of solving problems, etc. Therefore, conventional textbooks are not enough to deliver such material. It is necessary to create resources in the form of video lectures, video lessons, and text resources should be reduced to the minimum amount – in the form of handbooks with basic rules, formulas, theorems, etc. Educational material of the axiomatic level can be presented in the form of video tutorials, e-manual and multimedia presentations. Also it is necessary to actively use the links to external resources that cover material from the considered topic. Such resources will add credibility to the course and allow students to familiarize with additional sources of educational materials. Multimedia resources, including video resources of video portals, such as YouTube.com, embedded to the HTML-page of lesson. Examples of resource type "lesson" on Fig.2 are presented.

Fig.2. Embedded video to the html-page

Another feature of the e-course for Smarteducation is the existence of elements for communication and cooperation between the students in the performance of tasks of
mastering theoretical material, practical tasks, research projects, etc. Web 2.0 services, online services, social networks provide tools for organizing discussions, collaboration, counseling. These elements are embedded in the course directly through the platform that is used, or by reference to it. For joint projects and involving a wider number of participants of projects, communication, cooperation students social networking widgets, such as "In Contact", are embedded into HTML blocks of course (Fig. 3).

One of the main tendencies in the development of Smart Education is the openness of learning systems—placing the educational content openly available to students around the world, the development of systems with open code, development of knowledge-sharing under the scheme "student-student", "teacher-teacher", "students-teacher" and "students-teachers". An important step in the development of the idea of massive open electronic courses was the adoption of the UNESCO declaration on global policy on the issue of open courses, which sets the task of developing standards for electronic courses, providing synergy for access to them, conducting educational seminars on the development of courses and their use, collaboration between scientists and teachers, education quality assurance [11]. Electronic courses that have the properties required in the view of Smart Education is an effective tool for formal and informal learning, in which the most motivated students are interested now for obtaining high-quality knowledge, not only a diploma of higher education. For efficient organization of learning activity in the conditions of Smart Education modern university should have distributed information and educational environment that will enable the concentration of electronic learning resources and move knowledge into a distributed network, actively use the Web 2.0 services, mobile technologies, management system for learning content for delivering knowledge to the students and the interactive exchange of information data and training materials with them. In the future the development of such approaches is possible due to the joint development and use of the open educational content repository by the universities based on the technologies of Smart Education.
Literature


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