Information technologies in the educational process as the basis of modern distance learning

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Abstract - **The approaches to acquiring knowledge and skills on the basis of distance learning technologies are suggested. There are two approaches to distance learning under consideration: on the basis of distance learning management systems (LMS) and personal learning environments (PLE), which are based on the use of social services Web 2.0. Then approaches to distance learning by means of learning management system Moodle are considered.**

Keywords – **distance learning, distance learning management systems, personal learning environment, information and communication technologies.**

I. Introduction

The process of development of education in the high school is the implementation of new information technologies in the educational process.

For effective use of modern information and communication technologies in the educational process teacher should possess certain specific skills:

- to use modern information and communication technologies in preparing, analysis, adjustment of the educational process, managing educational process and learning activity of students;
- to select efficient methods and means of teaching taking into account individual characteristics of students, their inclinations and abilities;
- to combine effectively traditional methodological educational systems with the new information and communication technologies [1].

Nowadays the information and communication technologies are widely used in the educational process: using distance learning courses for organizing independent work of students, using audio and video in the classroom, teacher and students' presentations, books on electronic media, multimedia programs, educational sites etc. Under such conditions the information and communication technologies (ICT) can be a powerful tool for effective management of the educational process [2].

The aim of this article is to consider the methodological approaches to supporting the acquisition of knowledge by users on the basis of distance learning technologies, including social services Web 2.0 used in the process of creating personal learning environments.

II. Results

There are different approaches to the implementation of distance learning (DL) on the basis of:

- distance learning management systems (LMS),
- personal learning environments (PLE) [3].

In our view, effective implementation of distance education can be based on integration (synthesis) of personal learning environments (PLE) in distance learning management systems (LMS) [4].

One of these approaches reflects the use of packaged online courses and modules in the LMS, such as Moodle. The general idea of LMS is the integration of different tools into a single virtual space. LMS users need to spend some time at practical seminars to become familiar with these systems. It is also possible to use the student-centered approach based on constructing PLE out of set of certain web tools that are managed by individual users. We consider the synthesis of these approaches as an effective trend in DL aimed at the high quality of users training. Personal Learning Environment (PLE) is a term that appeared in Western literature and is widely used in MOOC (Massive Open Online Course).

The minimum PLE set should include: blog, ePortfolio, microblog, twitter and other web-based tools [5].

The social services Web 2.0, through which remote users can not only communicate but also create the content of Web pages, include such communication platforms and online tools [6]:

- blogs and microblogs (Twitter, Blog.com, LiveJournal);
- personalized home page (personalized Internet portal - iGoogle, Netvibes), implemented on the basis of user interfaces, web applications, where a web page sends requests to the server and downloads necessary data in the background without rebooting;
- systems of joint editorial offices (Google.docs, Spreadsheets);
- social bookmarking (Delicious, diigo, bobrdobr);

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- social networks and system of social presentations (Facebook, MySpace, Ning, Odnoklassniki.ru, Vkontakte);
- multimedia information dissemination systems (Flicker, YouTube, SlideShare);
- wiki (open encyclopedia Wikipedia, educational project Letopisi.ru);
- bricolage and mashup services that enable formatting and mixing different data formats (PingMe services, Del.icio.us, SkypeMe, Yahoo Pipes);
- webinars - various online activities: workshops, discussions, presentations, training and network broadcasts of various events (during the webinar link between the parties over the Internet is supported by a special web platform - dimdim, wiziq, "virtual classroom" of the company Web-soft);
- mindmaps - a convenient alternative recording technique (bubbl.us), the way to present the process of the systemic thinking by means of diagrams;
- modern technologies of the information syndication and notification Really Simple Syndication (RSS) that enable publishing and broadcasting almost any content from any site (from news to personal online diaries);
- PowerApps (available in a test version) - a new service that enables creating applications - from simple students questioning to applications operating on any device and integrated into corporate systems and cloud services. Course tutors will be able to quickly create applications without using programming languages in the familiar interface of Microsoft Office, which will function on any device. Developers can give users access to using them as a new source of data and creating required applications. They can also continue developing programs for the Internet, mobile applications and API using Azure. These applications will contain connectors to data of SaaS-services - Office 365, Dynamics, Salesforce, Dropbox and OneDrive, and local business systems - SharePoint, SQL Server, Oracle database, SAP etc .

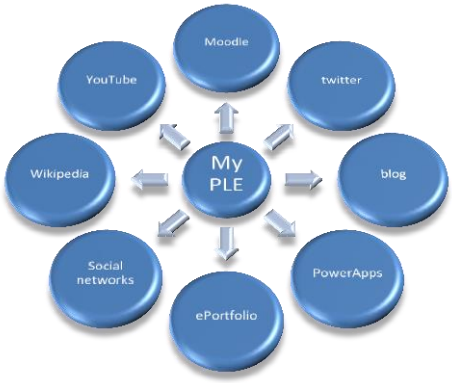

Fig. 1 Set of PLE tools

Construction of PLE on the basis of these tools is based on cloud solutions OnCloud, which provide certain advantages [7]:
- software is monitored and controlled;
- managing software versions is simplified;
- danger of the spread of viruses is minimized;
- initial data and received files can be stored and centrally managed on servers of firewalls;
- work can be performed on simple computer configurations.

The results of research into learning tools that can be used in cloud computing are published on the Internet, for example in Jane Hart's Centre for Learning & Performance Technologies [8].

LMS Moodle is characterized by the following key features:
- it is based on the philosophy of pedagogy of social constructivism and modern theory of educational measurement [9];
- it supports SCORM (Sharable Content Object Reference Model - model of exchange of educational materials) specifications, which can create, move and reuse educational Web content of distance courses in any environment regardless of the DL support platform;
- it supports the educational standards of distance learning E-learning 2, such social services as wiki, blogs, webinars etc. are also available.

Information Educational Technologies (IET) can be defined as a set of electronic tools and methods of their operation that are used for the realization of educational activity. The structure of electronic means consists of electronic hardware, software, and information components, methods of their application are specified in methodical maintenance of ITT.

The requirements for the architecture of the educational system (specification LTSA) are defined by the standard ISO IEEE P1484.1 / D8 - 2001-04-06 [10].

According to the standard, new computer educational technology must be regarded as a multi-level information system consisting of numerous elements combined by complex bonds.

Study of the components of information support of the educational process participants determines the need to consider the educational process as information system.

While developing methods and techniques of information system design a systemic approach is used. It is associated with analysis and synthesis of a system, defining goals of the information support of the educational process participants, their classification, ways of organizing information database tasks and methods of access to them by the objects of training.

The characteristics of this model are:
- the processes of learning and knowledge control can be formally described;
- the performance indicators of alternative teaching technologies can be assessed;

- the tasks of educational process optimization can be solved taking into account constraints (economic, ergonomic, technical) and target functions (performance indicators of the educational process).

To fulfill this complex task the solution of a traditional problem of compliance of information technology with didactic principles is required.

Thus, the use of Moodle in the educational process in higher education is a justified step. Such an approach will enable saving resources and educating users of e-materials and distance learning courses how to acquire knowledge and practical skills. It should be noted that distance learning is extremely flexible and provides personalized approach to each user, who will be able to choose the most convenient pace and place of study [11].

III. Conclusion

Thus, we can draw the following conclusions:

1. The use of distance learning technologies for training qualified experts is justified step as it will enable saving resources and remote teaching how to acquire knowledge and skills for obtaining a degree.

2. Personal Learning Environment (PLE) refers to a set of social services, programs, information materials ensuring comfortable learning environment for a remote user. The idea of PLE is that remote users should not only passively consume information obtained from a limited range of sources offered to them but use a variety of resources, to organize and to compare knowledge and as a result create new sources of knowledge.

3. Set of tools for creating personal learning environments can be integrated in LMS Moodle. It helps to fulfill the following key tasks:

- to provide participants of distance learning courses with the effective system of networking by means of forums, chats, blogs and webinars;
- to create a knowledge base for any distance course on the basis of social service Wiki without significant time resources and considerably increase efficiency of accessing and processing information in the distance courses for which asynchronous access of a large number of users to educational information is required.

The prospects for further research are analysis and selection of the effective social services, development of new approaches to forming personal learning environments and appropriate personal learning networks for the audience of certain distance courses (http://www.classroom20.com/), and their integration into the Moodle system.

In our view, development and implementation of these trends will increase the efficiency of remote support of users' knowledge acquisition.

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