

# Web-Based Learning and Development of University's Electronic Informational Educational Environment

Vardan Mkrttchian, HHH University, North Ryde, Australia

Igor Krevskiy, Penza State University, Penza, Russia

Alexander Bershadsky, Penza State University, Penza, Russia

Tatiana Glotova, Penza State University, Penza, Russia

Leyla Gamidullaeva, Penza State University, Penza, Russia

Sergey Vasin, Penza State University, Penza, Russia

## ABSTRACT

Web-based learning has been developed by the majority of academic institutions and organizations worldwide due to its obvious benefits for both educators and learners. Meanwhile, many of the existing developmental approaches in this sphere lack one crucial consideration necessary for implementing web-based learning at academic institutions. In this article, the authors identify two processes: development of distance learning and digitalization of training that are represented now at almost every academic university. The article singles out the stages of their development and shows that the processes lead to the same result - a new quality of education. The authors focus on figuring out which path is more effective for achieving the highest level of development depending on university's characteristics. Accumulation of detailed information in the Electronic informational educational environment about current learning outcomes creates opportunities for emerging trends, such as Learning Analytics, Personalized Learning and Adaptive Learning. In data analysis using BigData and Machine Learning technologies.

## KEYWORDS

Big Data and Machine Learning Technologies, Data Science in Learning, Electronic Information Educational Environment, Web-Based Learning

## INTRODUCTION

The Internet's exceptional significance and potential as a mediator in data transferring in combination with information technologies have led to emergence of various applications, including in the field of education. Without a doubt, one of such applications is distance learning. The use of the Internet for educational purposes has provided both teachers and students with numerous new methods and tools (Khan, 1997). The Web-interface of the educational environment was developed on the basis of

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traditional design models, such as instructional systems design (Dick & Carey, 1996) and constructivist learning environment (Jonassen, 1999).

E-learning development is one of the top trends in the field of education. No need to mention that the Internet has become one of the key sources of knowledge, and universities should adapt to such global shifts and change the existing approaches to education.

At the present time there are two trends of distance learning development at universities contradictory to each other:

- Distance learning programs development: increasing a number of online courses, expanding possible field of application due to adoption of various simulators, interactive elements, etc.;
- Integration of certain distance learning elements into traditional education.

Electronic informational educational environment (EIEE) has been actively implemented in many universities, especially in Russia after the introduction of new educational standards in 2014-2016. Educational resources applied in teaching should be sited in a specifically designed informational environment intended for providing efficient communication between teachers and students and containing students' portfolios, their achievements and results, attendance and learning outcomes etc. (Krevskiy, et al., 2018). The implementation of these requirements actually incorporates elements of distance learning into any educational program.

In the age, when universities strive to provide students with cutting-edge educational technologies, various academic institutions use the so-called learning management systems (LMS). LMS is a Web-based educational system aimed at supporting teachers in development, administration and management of distance learning courses. Although such systems offer great opportunities to users, they have some problems with insuring intelligent support and adapting to users' needs.

Nowadays there are different LMSs designed both for commercial use and open-access, such as the Moodle, the Sakai, the eTutor and Ilias, Web Course Tools (WebCT), the Desire2Learn et al. Some LMSs are used in the framework of distance learning programs of higher education. The authors (Selim, 2007) examine success factors of distance education at universities. Based on a factor confirming analysis, a survey of 538 university students revealed 8 categories of success factors. Each of them included a series of important assumptions and measurement methods. Ngai et al. (2007) developed a technology acceptance model, including technical support, and then investigated the role of an extended model when using the WebCT system.

Observing modern research, less attention is paid to obstacles and problems of combining traditional education with distance learning technologies at universities, as well as new approaches to organization and administration of educational programs. Though, such problems take place at both universities that only begin implementing distance learning technologies and those with sufficient experience in the given field.

Besides, one should pay attention to the issues of combining the project-based approach in education with LMS development at universities.

The key aspect of the project-based approach is ensuring an opportunity for students to study at university subject to their capabilities, interests, experience (Piaget, 1968). Moreover, it's hard to overestimate the project-based approach when teaching students with disabilities, which extremely important from the point of view of inclusive learning in higher education.

The main goal of the present research is to analyze leading trends, approaches to combining management technologies and methods for distance learning and traditional education within universities. They are associated with modern teaching technologies, student body peculiarities and other aspects.

The article describes the considerable accumulated experience of Penza State University in administering higher education programs, teaching online courses (including by foreign tutors: Vardan Mkrtchian from HHH University, Australia and embedded systems developer Igor Tuzhilov

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