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MASSIVE OPEN ONLINE COURSES' IMPLEMENTATION IN BLENDED FORMAT AS A NEW APPROACH IN UKRAINIAN HIGHER EDUCATION

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The article indicated current trends in education, in particular - the concept of blended learning. The blended learning key models are presented. Based on the study's results further introduction of blended learning in the specialists' training can be made.
Keywords: blended learning, massive open online course, rotational model, flex-model, a la carte model, enrich virtual model

Introduction. The rapid development of Internet-technologies, the ability to access digital networks any time and in any place, new gadgets for surfing the web and increasing amounts of information have caused an interest in usage web-technologies in the educational process. In 2008 Dave Cormier introduced the term MOOCs (Massive Open Online Courses). Such courses are available online for a wide audience and are designed for all interested users with Internet access regardless of age, sex, nationality, country of origin, social standards etc [1]. In 2012 the world's top three modern online education platforms were launched simultaneously: Coursera (founded by Stanford University professors), Udacity (founded by Stanford University professors, developed due to courses of Georgia Institute of Technology) and edX (Harvard University and the Massachusetts Institute of Technology collaboration project).

Problem statement. Further development of online-courses and implementation of blended learning involves an increase of amounts of data, which has to be thoroughly processed. The rapid growth of AI's industry and Big Data creates new opportunities for education. Nowadays systems are capable of optimizing the presentation of the course's content, suggesting next steps in subjects studying, dynamical planning of individual lectures with teachers for students with special needs, and even create timetables of school buses accordingly to the time of courses running. The usage of neural networks in education gives an opportunity of utilizing the data, that students generate during their studies, with the purpose of automatic generation of recommendations for a particular

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student about the further learning process. For example, by using data about students' success at different courses in conjunction with their social portraits it is possible to create a system that will act as an assistant, capable of directing a student in fields he or she is most brilliant in.

The main problems in the modern Ukrainian education which prevents further development and specialists' preparation are students' motivation, economic difficulties in the society, lack of professional professors in the leading technological fields, poor English knowledge to obtain needed information through online courses created by world's leading universities and so on.

Modern articles and researches in the field analysis. In particular, MOOCs, as well as SPOCs (Small Private Online Courses), are aimed to revolutionize universities and the corporate education landscape. In the article "Higher education and the digital revolution: About MOOCs, SPOCs, social media, and the Cookie Monster" [2] Andreas M. Kaplan and Michael Haenlein provide a nuanced analysis of the phenomenon of online distance learning and conclude that the only thing MOOCs cannot provide is socializing which has become over the years one of the top reasons to enroll in the institution and universities for young adults.

Sharing of resources and metadata is a central principle in scientific and educational contexts, especially in our research that is based on open source technologies for education. With the emergence of the Linked Data approach as the most recent evolution of the Semantic Web, scientific and educational practitioners have started to adopt those principles. In the paper called "Linked Data for Science and Education" [3], Carsten Keßler, Mathieu d'Aquin and Stefan Dietze give an overview of the current landscape related to the use of Linked Data in the academic sector. Dmitry Mouromtsev, Fedor Kozlov and others have created a system that allows to interlink terms from different courses and domains and calculates several educational rates: term knowledge rate, total knowledge rate, domain knowledge rate and term significance rate. These rates are used to give the student recommendations about the activities he/she has to undertake to pass a course successfully [4]. Also, they have described use cases and developed architecture of the course extraction plugin for the Open edX platform build upon Linked Open Data. Frequent repetitions of educational materials within the MOOC and relativity of recommendation tools for course developers are considered in their paper [5]. They have given a comprehensive review of the designed ontology and mapping, and evaluation using test courses. In our research, we will provide a new way to recommend courses, analyze Open EdX data with AI technologies.

Estimating students' knowledge based on their interactions with computer-based tutors has the potential to improve learning by decreasing time taking assessments and facilitating personalized interventions.

Although there exist good student models for relatively structured topics and tutors, less progress has been made with more open-ended activities. Further, students often complete activities in pairs rather than individually, with no coding to indicate who performed each action. Such students' performance can be improved by the blended learning technologies implementation.

The online educational technologies and blended learning are also described in the researches by S. Kemps, L. Burkova, K. Ellis Ryann, D. V. Anderson, E. Van Meer, M. Bradford, M. Porciello, N. Balkon, N. Backus and others.

Research objective. The research's main aim is to analyse modern blended learning methods and their implementation in Ukrainian higher educational system to give students an opportunity to get up-to-date knowledge. We argue that massive open online courses created in Ukrainian by leading specialists in their fields and their implementation to the educational process can give a chance to study regardless of tsudents financial state or an opportunity to enroll to the leading universities. The massive open online courses have already started changes in modern Ukrainian education.

Statement of basic materials. The first successful massive open online courses platform in Ukraine was founded in October 2014 — Prometheus platform today has more than 500000 active users, and this number is constantly increasing [1]. All courses offered by the platform are in Ukrainian and most of them are developed by leading Ukrainian professors. In 2016, the Prometheus platform, together with leading universities in Ukraine, launched a pilot project on the blended learning technology using MOOC introduction. Four universities have joined the pilot project: the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", the Ivan Franko National University of Lviv, the Lviv Polytechnic National University, the Ukrainian Catholic University. The blended learning technologies introduction enables the professor to focus on communicating with students, assessing their skills and abilities, rather than presenting information material, which is sometimes difficult to hold in classroom. In a blended format, the student can spend time by himself at home or dormitory to learn the material and, during a problem-oriented lecture, present new materials and examples for both students and the teacher. Using media content increases the visibility of the material provided, develops associative relationships, which, in turn, increases the remembering new information quality. The materials availability online simplifies the learning process in general — no barriers and full access make it possible to master the discipline in a student-friendly manner and in a convenient place.

In modern blended learning practice different models are used. The most popular for higher education institutions is a rotational model of various types, a flex model, a la carte model and enriched virtual model [6, 7].

With the rotational model's use there are three types of interaction between the teacher and the students. First, the rotational model at stations, when students move from one part of the audience to another, from the station to the station with an activity's change. In Ukraine this model is used for higher education institution's students. For example, the first station provides video viewing, on the second station is practical use on the chosen equipment, on the third is testing, etc. The stations and the order of their use are selected by the teacher in accordance with the course's objectives, together with the students, to determine the type of work that will be most convenient for all participants in the educational process. The second option is laboratories rotation, which involves laboratory classes and the use of laboratory equipment. The third option is "flipped classrooms", in which all the lecture materials and preparation for the class are transmitted online, and in the classroom the students perform practical tasks and mastered other activities at home or in another environment with access to the Internet.

The Flex model is used as an open space that can be arranged so that up to 100 people are simultaneously trained. Each has access to all equipment hosted, can watch online video, can contact other students, and more. The teacher completely turns into a mentor, who explains incomprehensible moments, together with the student develops a "road map" for studying the discipline, and for each student, such a plan of training will be individual and everyone needs an individual approach.

The a la carte model envisages the presence of a full-time online tutor or classroom program - both lectures, and practical classes, as well as laboratory classes, if necessary, the student can do completely online, including checking his assignments using the online learning platform.

The enrich virtual model is available only in the world's leading institutions Each of the courses available in a particular higher education institution has two options: online and offline. A student can choose courses that he or she listens to in a regular audience, and maybe additionally or even as the principal take courses that he passes online on the platform of a higher education institution. Communication with the teacher is also happening online, as well as the student achievements assessment and their further consideration in the diploma.

Conclusions. The conducted research allowed to highlight the blended learning key benefits: increased interaction between faculty and students and students in the team; enhance active learning in the classroom; pre-preparation for further work in the classroom; analyzing interesting

cases, engaging media content instead of explaining basic concepts; access to materials at any time; resources saving. Among the disadvantages: dependence on technical equipment; great digital literacy threshold; lack of team work; motivation for self-study and mastering material.

The blended learning provides an opportunity to overcome the general lack of skilled staff in all areas of knowledge in Ukraine. Specialists in Ukraine do not have free access to most of the world's scientific developments, but due to the openness of massive online courses and the possibility of using lectures by leading specialists in the field, it is possible to overcome the gap in knowledge and provide students with relevant and substantiated material from the world's experts. A serious human resource problem in regional higher education institutions in Ukraine can be overcome by creating professional courses at higher educational institutions that are leaders in Ukrainian education in training.

Over the next two academic years, the Prometheus platform plans to introduce MOOC in a blended format in 40 higher educational institutions in Ukraine, most are technical universities.

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ВПРОВАДЖЕННЯ МАСОВИХ ВІДКРИТИХ ОНЛАЙН-КУРСІВ У ЗМІШАНОМУ ФОРМАТІ ЯК НОВИЙ ПІДХІД В УКРАЇНСЬКІЙ ВИЩІЙ ОСВІТІ

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У статті висвітлено основні тенденції у освітньому процесі, зокрема – концепцію змішаного навчання. Представлені моделі змішаного навчання. Із опертям на дослідження можливо сформулювати настанови для підготовки фахівців із використанням змішаного навчання та онлайн-навчання в системі української вищої освіти.

Ключові слова: змішане навчання, масовий відкритий онлайн-курс, ротаційна модель, флекс-модель, модель а ла карте, насичена віртуальна модель.

ВНЕДРЕНИЕ МАССОВИХ ОТКРЫТЫХ ОНЛАЙН-КУРСОВ В СМЕШАННОМ ФОРМАТЕ КАК НОВИЙ ПОДХОД В УКРАИНСКОМ ВЫСШЕМ ОБРАЗОВАНИИ

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В статье описаны основные тенденции в образовании, а именно – концепцию смешанного обучения. Представлены модели смешного обучения. Основываясь на исследовании возможно создание практических указаний для использования смешанного обучения и онлайн-обучения в подготовке будущих специалистов в системе высшего образования в Украине.

Ключевые слова: смешанное обучение, массовый открытый онлайн-курс, ротационная модель, флекс-модель, модель а ла карте, насыщенная виртуальная модель.