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Educational Data and Learning Analytics in KazNU MOOCs Platform

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The initial hype around massive open online courses (MOOCs) already subsided, but the number of new learners in MOOCs platforms is still growing. Due to low completion rates in the MOOCs compared to enrolled students it is important to establish and validate quality standards for these courses. Employing of educational data and learning analytics to improve lesson plans and course delivery become an innovative approach for teachers, curriculum developers and policy makers in education. Learning analytics of online courses can be also used for enhancement of classroom teaching by blending online and face-to-face learning models.

This work presents some observations about the behavior of students, obtained by analyzing the data generated during delivery of 13 MOOCs. Besides classification of learners by analysis their activity data, other interesting characteristics about platform learners like demographic, gender and level of education are described. The results indicate that the quality of interpersonal interaction within a course relates positively and significantly to student scores.

Keywords: MOOCs, learning analytics, educational data, online learning, blended learning.

Әл-Фараби ат. ҚазҰУ-нің MOOK платформасында білім беру мәліметтер мен ақпараттың сараптамасы

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Жаппай ашық онлайн курстар (ЖАОК) алғашқы дүрлікпе төмендеді, бірақ ЖАОК платформасындағы жаңа студенттер саны әлі де өсіп келеді. Тіркелген студенттер санымен салыстырғанда, ЖАОК-ты аяқтаушылар біршама аз болғандықтан, бұл курстарды сапа стандарттарын құрастыру және бекіту маңызды қадам болып табылады. Оқу жоспары мен оқу курстарын жетілдіру үшін білім беру деректерін және ақпараттың талдауды қолдану оқу бағдарламаларын әзірлеушілерге және білім беру саясатын құрастырушыларға инновациялық тәсіл болып табылады. Онлайн-курстың деректерін талдауды қашықтықтан және дәстүрлі оқыту модельдерін араластыру арқылы оқу процесін жетілдіру үшін пайдаланылуы мүмкін.

Бұл мақалада 13 ЖАОК-та жинақталған деректерді талдау арқылы алынған курс қатысушыларының іс-әрекеті туралы кейбір зерттеулер келтірілген. Нәтижелер курстың ішіндегі өзара қарым-қатынастың сапасы студенттер үшін оң және маңызды екенін көрсетеді.

Түйін сөздер: ЖАОК, ақпараттың сараптамасы, білім беру мәліметтер, онлайн оқыту, арарлас оқыту.

Образовательные данные и аналитика обучения на платформе MOOK КазНУ им. аль-Фараби

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Начальный ажиотаж вокруг массовых открытых онлайн курсов (МООК) пошел на спад, но число новых учащихся на платформах МООК все еще растет. Из-за низких показателей завершения МООК по сравнению с зарегистрированными студентами, важным этапом является установление и утверждение стандартов качества для этих курсов. Использование образовательных данных и аналитики обучения для улучшения планов уроков и предоставления курсов станет инновационным подходом для учителей, разработчиков учебных программ и политики в области образования. Аналитика обучения онлайн курсов может быть использована для улучшения образовательного процесса смешиванием дистанционных и традиционных моделей обучения.

В данной работе представлены некоторые наблюдения о поведении слушателей курсов, полученные путем анализа данных, накопленных при проведении 13 МООК. Результаты показывают, что качество межличностного взаимодействия в рамках курса имеет положительный и существенный характер для учащихся.

Ключевые слова: МООК, анализ обучения, образовательные данные, онлайн обучение, смешанное обучение.

1 Introduction

In 2012, Massive Open Online Courses (MOOCs) made a real sensation in the higher education sector, providing open access through the Internet to the best courses from the best professors and universities of the world [1]. For the last 6 years the number of MOOCs and open education platforms has continuously grow around the world. These MOOCs platforms are developing together with universities evolving into a new market of higher online education providing massive online specializations, credentials and academic degrees [3]. If we look at the numbers, now there have been released more than 7,000 online courses (Figure 1) from above 750 universities and institutions, which are located in more than 40 MOOCs resources where up to 60 million users are enrolled [2]. This numbers are given only according to the data of the Class Central MOOCs aggregator where many other online courses and providers are not taken into account.

The Learning Management System (LMS) allows to collect detailed information about the users' activities and interactions with course content during the learning in the online course. These data are actively used by researchers to improve the quality of educational resources and improve the content of online courses, as well as a deeper understanding of the learning process in online format and other practical purposes (see e.g., [4], [5]). In addition, the accumulated data is sufficiently large to facilitate the development of intelligent LMS and new methods of active learning in the future.

One of the negative indicators of MOOCs is a large dropout rate [6]. But in many cases they do not take into account the fact that learners participate in the MOOCs with different initial intention and motivation [7]. If the traditional university courses are mainly attended by full-time students whose main activity is studying, then MOOCs participants are mostly employed people with tertiary education [8]. According to statistics it is known that for in MOOCs about half enrolled students never engage with any of the content [9]. Most of the students do not reach the end of the course due to lack of time or lack of digital and learning skills for studying by online courses [10]. Therefore, the classification signed up for MOOCs students in their initial motivation will help determine the exact causes of failure and to understand how to improve the course to achieve their goals.

In this paper we try to describe some finding about our MOOCs learners and classify them by their activities. Also we try to answer to the following questions:

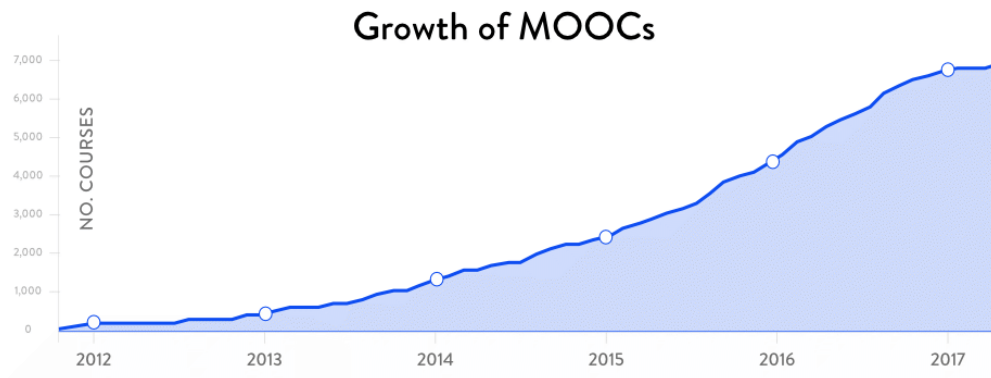


Figure 1: Growth of MOOCs number from 2012 according to Class Central data [3]

1. What is the motivation of each MOOCs learner?
2. How they interact with each other and teaching staff?
3. What they should do to successfully finish the course?

This findings and question answers can help to understand MOOCs developers and providers how improve course content, schedule and delivery methods, also policy makers and administration of universities can evaluate of MOOCs potential to include in academic process in appropriate blended learning model.

2 Literature Review

Several investigators (e.g. [11], [12]) expect that MOOCs can play an important role in future of global education system and even change it. The popularity of MOOCs has made a high volume of learner data available for analytic purposes. A number of scientists began to perform relative researches based on MOOCs data recently, which mainly focus on two aspects. The first is how to improve the MOOCs platform in personalization or to provide new features for both learners and instructors. For example, J. J. Williams and B. Williams [13] investigated how varying reminders and resources sent through emails to participants influence their use of course components like forums and their overall outcomes. C. Shi et al. [14] introduce VisMOOC, a visual analytic system to help analyze user learning behaviors by using video clickstream data from MOOC platforms. Kennedy et. al. [15] analyzed the relationship between a student's prior knowledge on end-of-MOOC performance.

The second aspect is to explore cognitive rules of learner by analyzing learning behavior and therefore to predict their following actions such as whether he will fall out the course. Predicting student performance in MOOCs is a popular and extensive topic. Kizilcec et al. [16] presented a simple, scalable, and informative classification method that identifies a small number of longitudinal engagement trajectories in MOOCs. Learner classification can be fulfilled by different criteria. Researchers from Stanford [17] divided learners into five categories by analyzing learning activities such as viewing a lecture and handing in an assignment for credit: Viewers, Solvers, All-rounders, Collectors, and Bystanders. Researchers