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ORGANIZATION OF NON-FORMAL EDUCATION FOR STUDENTS AND ITS EFFECT ON THEIR ACADEMIC PERFORMANCE

Abstract

The use of massive open online courses as one of the main resources for non-formal education in the Republic of Kazakhstan is discussed in the article. The purpose of the article is to describe the organization of non-formal education for the students of the educational program "Pedagogy and psychology" and determine its effect on students' academic performance. To demonstrate the data collected throughout the research process, a number of pedagogical methods as theoretical and comparative analysis, testing, content analysis and pedagogical experiment were utilized. The description of organization of non-formal education at the university aims at providing a comprehensive overview for readers the ways to understand and compare the key concepts and organization stages in the field of non-formal education. 4 massive open online courses on the Coursera platform were included into the educational process as non-formal education. Moreover, the courses content, strategies and assessment effected on students' learning outcomes and their academic performance in general. The results of empirical study illustrated that massive open online courses offered by Coursera improved students' academic performance by 15.6% and gave them the opportunity to pursue their goals outside the classroom, moreover, fostered the development of their metacognitive skills.

Keywords: non-formal education, professional development, personal development, Coursera, academic performance, university students.

Introduction. The significance of non-formal education is currently growing and making a consideration of Kazakhstani higher education policy. Non-formal education is discussed as an addition to formal official system of education. Non-formal education is not limited by time, venue, or style of instruction and it is carried and organized outside of the formal education. The use of non-formal education in higher educational institutions has gained approval by the administration and learners. Many ways to get additional materials from non-formal education courses and monitor students' progress after these courses have been appearing nowadays.

Numerous national and international research and studies demonstrate that non-formal education is demanded as an integral part of domestic educational strategy. The development of personal potential, which is provided by non-formal education, is reflected in learners' willingness to set objectives and look for some strategies and tactics for achieving them through ongoing self-education (Ivanishcheva, 2022). The aim of non-formal education is to offer students practical ways to ensure personal growth in addition to academic acquisition and performance. The organization of non-formal education also leads to individualization of the learning, which means the focus on the particular goals of each student. Yakushina (2020) has demonstrated in the study that a student's personal experience, individual and systematic learning, ability to select necessary courses and learning outcomes should all be the basics of non-formal education.

Apart from the need of an individualized approach to learning, non-formal education has a positive impact on the interaction between students' abilities and opportunities to acquire knowledge in a particular field (Holland, 2019). The significance of massive open online courses

(MOOCs) as a non-formal educational resource is rising gradually. Learners are allowed to choose the location, speed of leaning or pace, time of their study in massive open online courses and students are better able to regulate their own learning process (Jansen et al., 2020; Essomba et al., 2022). Regular online courses are different from MOOCs in that the latter are free to enroll in, they contain materials that are accessible to the general public and do not require a payment for registration until official certification (Lee et al., 2019; Al-Rahmi et al., 2018). MOOCs offer the opportunity of studying a multitude number of students simultaneously and everyone can register using software with open-source access. The main strategy of learning is independent study, success in autonomy involves and reinforces the use a self-regulation method (Maldonado-Mahauad et al., 2018; Souto-Otero, 2021). MOOCs support participants' academic ability to increase and foster the development and advancement of professional skills in the field of education. MOOCs are utilized by leaners as an additional resource for enhancing self-education, professional and personal development, and academic performance (Alimova et al., 2022; Cheng, 2022; Irwanto et al., 2023).

Materials and methods. The Ministry of Science and Higher Education started collaborating with Coursera, a MOOC platform, in order to spread non-formal education at universities and computerize some spheres of education in the Republic of Kazakhstan. Open access is the key component of these online courses. Several typological models of MOOCs have emerged since their creation:

- cMOOCs give learners a platform to engage in self-organized learning where students can set their own goals, express their own opinions and work together to produce and share information with each other. The main aim of the participants is to collaboratively study the course topic through the development of relevant knowledge by searching for and providing subject-related information and social connections. Additionally, assignments and tests are graded by peers using rubrics with all requirements for learning results that help students better understand the material.

Therefore, students are considered as the main subjects of studying process and network learning environment. This model of massive open online courses defines learning as the process where a learner grows and develops at the same time. The primary benefits of this type of online courses are equality, transparency and easy access for all students. The drawbacks of this type of MOOC include a teacher's loss of control upon the learning process and also some participants can misuse educational resources. Moreover, cMOOCs are quite promising in terms of setting up professional development classes in special communities (Amado et al., 2022);

- in xMOOCs teachers define learning objectives and provide brief video lectures to share their knowledge and information about the course. These lectures are frequently followed by easy online course assessment. Peer assessment is rare among xMOOCs. They prove that teaching technologies meet international standards and the fact that methodological and instructional content from prestigious universities is freely accessible to the public. Furthermore, they give course participants a limited platform to communicate with each other, only discussion boards. Behaviorism and cognitivism theories serve as the foundation for this type of MOOCs, which also include elements of social constructivism and emphasize learning by doing through experiments, project-based or task-based activities. The main advantages are highly professional certified teachers, a well-defined curriculum that is broken down into modules, an automated system that registers how well students learn the subject. This model offers learners a forum for open discussions, technical support, and access to any required information (Mahajan et al., 2019);

- task-based MOOCs courses are organized with the tasks that can be used in a variety of ways and forms including the development of group projects, audio and video presentations, written assignments, and collaborative problem-solving cases. These techniques are open resources that anyone can utilize with different technologies including interaction. Assignments can be completed by students themselves or in groups with other learners. In

order to demonstrate that the abilities have been acquired, it is crucial for this type of MOOC to complete a particular number of assignments. The course model includes scaffolding that is added to the content of the course. To complete this task-based MOOC, the learners should apply and synthesize the principles that they have studied during the course in a final project or a milestone project. The essential components of xMOOC and cMOOC are combined in these task-based MOOCs. Participants in the course have the option of completing free task activities and choose their projects (Amado et al., 2022).

According to the description of the mentioned typical models of massive open online courses, the Coursera platform can be classified an a xMOOC type.

The purpose of the study is to describe the organization process of non-formal education at university and determine its effect on students' academic performance.

This section shows the study of data collection by applying the scientific research methods which included, firstly, content analysis in the field of non-formal education and its key concepts. Secondly, the method as pedagogical experiment involved 64 students of 2nd and 3rd year of the educational program "Pedagogy and Psychology" and demonstrated diagnostics of academic performance at ascertaining and final stages. Participants were divided into control and experimental groups, 32 students in each group. Thirdly, the empirical component of the research was based on testing at mid-term period and learning outcomes at the end of massive open online courses. The counting was carried out with non-parametric statistical criterion Mann-Whitney U-test (Saegusa, 2020) and the SPSS Statistics program 27.0.

Students received a proposal to complete massive open online courses on the Coursera platform. The most chosen courses occurred "Leading teams: Building Effective Team Cultures", "Effective Problem Solving and Decision Making", "Project Management: The Basics for Success" and "Successful Negotiation: Essential Strategies and Skills". After completing the courses, the instructors indicated their mid-term test results, Coursera grades and students' academic performance in general. These are research questions related to support the usage of mentioned research methods: "What differences in academic performance between the experimental and control groups were noted before to the pedagogical experiment?", "In what ways does the pedagogical experiment impact on academic performance in the experimental and control groups?", "What effect does the organization of non-formal education have on academic performance of students of the educational program "Pedagogy and Psychology"?". Answers to these questions help to follow the process of organization of non-formal education and its effect on their academic performance.

Results. The Ministry of Science and Higher Education of the Republic of Kazakhstan distribute grants to regional educational institutions every year for completing online courses through the Coursera platform. The educational program "Pedagogy and Psychology" of the university organized non-formal education for students with the help of Coursera platform. 32 grants were given to the third cohort of learners of this educational program. Thus, 64 2nd and 3rd year students of the educational program "Pedagogy and Psychology" took part in the ascertaining stage of the pedagogical experiment. Participants in the experiment were split up into groups of 32 students each for the control and experimental groups. To determine their academic performance, both groups took an exam and rated mid-terms from the disciplines they have studied. For the second-year students the disciplines as "Developmental educational psychology", "Psychological personality diagnostics" and "Differential psychology" were considered. For the third-year students the following disciplines as: "Practicum on experimental psychology", "Social-psychological training" and "Psychology of management" were taken into consideration.

The ascertaining stage results of the pedagogical experiment illustrated an average academic performance of both groups: 9 (28,1%) respondents in the control group and 7 (21,9%) students in the experimental group showed high academic performance, while 19 (59,4%) students in the control group and 20

students (62,5%) of the experimental group illustrated the average academic performance, the control group students demonstrated a low level – 4 students (12,5%), and 5 students or 15,6% from the EG.

Table 1 demonstrates the findings of the diagnostic stage of the pedagogical experiment, which involved the assessment of the academic performance of the control group.

Table 1. *Findings of diagnosing academic performance of the control group (n=32)*

Stage	Academic performance of the control group					
	high		average		low	
	number of students	%	n u m b e r of students	%	number of students	%
Ascertaining	9	28,1%	19	59,4%	4	12,5%

At the ascertaining stage of pedagogical experiment, the indicators show that learners of the control group gain academic performance in a high level – 28,1% (9 students), in an average level – 59,4% (19 students) and in a low level – 12,5% (4 students).

Table 2 demonstrates the findings of the ascertaining stage of the pedagogical experiment, which involved the assessment of the academic performance of the experimental group.

Table 2. *Findings of diagnosing academic performance of the experimental group (n=32)*

Stage	Academic performance of the experimental group					
	high		average		low	
	number of students	%	number of students	%	number of students	%
Ascertaining	7	21,9%	20	62,5%	5	15,6%

Students achieve academic excellence, according to the findings of the diagnostic stage of the experimental group's academic performance, in a high level – 21.9% (7 students), in an average level – 62,5% (20 students) and in a low level – 15,6% (5 students).

The statistical significance between the control and experimental groups' results was determined through the usage of the non-parametric Mann-Whitney U-test method in mathematical statistics. This criterion demonstrates that at the ascertaining stage, there were no differences between the experimental and control groups' levels.

The following formula presents the statistics criterion:

$$U = n_1 \cdot n_2 + \frac{n_x \cdot (n_x + 1)}{2} - P_x$$

The sum of ranks for the experimental group is 1027, for the control group – 1052. Let us denote the largest sum by $P_x=1052$.

The statistics criterion allows to formulate two hypotheses:

H_0: the experimental group does not exceed the control group in terms of academic performance level.

H_1: The experimental group exceeds the control group in academic performance level.

Determining the value U_{emp} using the proposed formula we get:

$$U_{emp} = 499$$

Thus, U_{crit} = p≤0.01 – 338, p≤0.05 – 389, therefore, the samples have statistically insignificant differences and the H0 (null hypothesis) that the experimental group and the control group are homogeneous is accepted. Hence, at the ascertaining stage, the EG does not exceed the CG in terms of academic performance level.

The students of experimental group studied 4 massive open online courses on the Coursera platform: "Leading teams: Building Effective Team Cultures", "Effective Problem Solving and Decision Making", "Project Management: The Basics for Success" and "Successful Negotiation: Essential Strategies and Skills" during the forming stage of pedagogical experiment. The courses chosen by students of the experimental group were held in the English, Kazakh, Russian languages on the Coursera platform and they are presented in Table 3:

Table 3. *Courses chosen by students of the experimental group (n=32)*

#	Course title	Number of enrolled students
1	"Leading teams: Building Effective Team Cultures"	12
2	"Effective Problem Solving and Decision Making"	9
3	Project Management: The Basics for Succes	6
4	"Successful Negotiation: Essential Strategies and Skills"	5

The courses on the Coursera platform include several modules depending on their content. The first place takes the course "Leading teams: Building Effective Team Cultures" from the University of Illinois, it consists of 5 modules. 12 students or 37,5% chose this course, which gives advice on creating a productive team culture. Students in this course acquire the skills necessary to create culture that values inclusiveness, safety, growth in order to produce the best possible team work. The course "Effective Problem-Solving and Decision Making" from the University of California was selected by 9 students (28,1%) and takes the second place. The course offers 4 modules on the platform. The course teaches students how to produce, analyze and evaluate potential solutions as well as utilize decision-making strategies. The learning objectives of "Effective Problem-Solving and Decision Making" are building subject matter knowledge, gaining basic understanding of a topic and tools, and getting experience to improve employability. In third place among students' choice is the course "Project Management: The Basics for Success" from the University of California, consisting of 4 modules. 6 students or 18,8% applied to this online course. In this course, students learn the roles of high-performance teams in project management, tools and methods for developing and strengthening teams, stages of the project cycle, planning and control of projects. The last course in the list is "Successful Negotiation: Essential Strategies and Skills" presented by University of Michigan, which contains 7 modules. 5 students (15,6%) completed the named online course. All modules describe the role of negotiation with friends, family, neighbors, colleagues, employers and others. The course reveals negotiation strategies, key tactics for success, and the ways to become an effective negotiator. It also focuses on some psychological tools to use during meetings. The last module gives the learners chance to practice their negotiation skills in the discussion board section.

The courses on the list included an interview, reading materials, videos, assignments graded by other students. Computer examinations and written assignments are required for the assessment. 32 students of the experimental group received certificates of successful completion after completing their courses.

The students of the experimental group finished their courses in the organized non-formal education through MOOCs on the Coursera platform. The students of control group studied only in traditional way of the learning process. The research data show some differences in their academic performance. Positive changes were also observed in the control group, mostly on an average level. The experimental group passed through quantitative changes in the level of academic achievement as demonstrated by the non-parametric Mann-Whitney U test.

Table 4 is a comparative table for diagnosing academic performance at the end of the pedagogical experiment between the control and experimental groups.

Table 4. Comparative table for diagnosing academic performance of the CG and EG at the ascertaining and final stages of the experiment

Stage	Control group			Experimental group		
	levels in %					
	high	average	low	high	average	low
Ascertaining	28,1%	59,4%	12,5%	21,9%	62,5%	15,6%
Final	34,4%	56,2%	9,4%	37,5%	56,2%	6,3%
Comparison	+6,3%	- 3,2%	- 3.1%	+15.6%	- 6,3%	- 9,3%

Using this statistical procedure, the control group didn't show statistically significant changes in academic performance by the experiment conclusion. On the contrary, the experimental group demonstrated an increase in high-level academic performance. The data are illustrated in Figure 1.
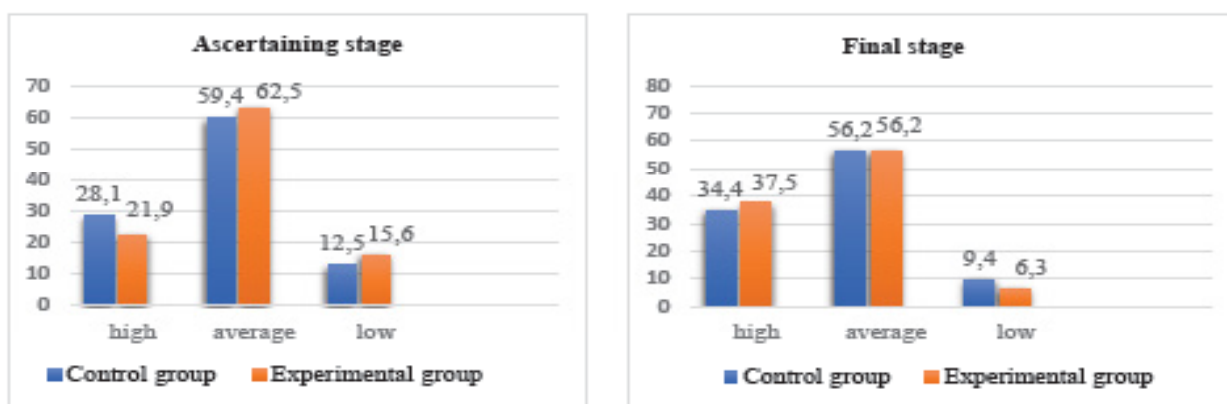

Figure 1: Comparison of diagnostics of academic performance level of the CG and EG at the ascertaining and final stages of the experiment

In response to the first research question: "What differences in academic performance between the experimental and control groups were noted before to the pedagogical experiment?", the results show that there is no difference in academic performance between the experimental and control groups, for this reason the non-parametric Mann-Whitney U-test and method of mathematical statistics were used to test the hypothesis H0 and at the ascertaining stage of the experiment. The control and experimental groups were homogeneous at the beginning of the pedagogical experiment. Answering the second research question: "In what ways does the pedagogical experiment impact on academic performance in the experimental and control groups?", the control's group's high level of academic performance went from 28,1% up to 34,4% 06 +6,3%, after taking massive open online courses on the official Coursera platform. The level of high level of academic performance of the experimental group increased by 15,6%, from 21,9% to 37,5%. So, we observe that the usage of non-formal education in the pedagogical experiment had impact on students' academic performance. The third research question was "What effect does the organization of non-formal education have on academic performance of students of the educational program "Pedagogy and Psychology"?". We concluded that enrolling in massive open online courses benefits the growth of metacognitive skills in addition successful academic performance. The students of experimental group demonstrated greater independence, ability to recognize secondary and tertiary information in addition to current one, confirmed perseverance and

finishing challenging assignments in class, and started providing more feedback. The results of the study illustrate that students' academic performance is positively impacted by MOOCs offered on the Coursera platform.

Discussion. After completing 4 courses, students gain the skills necessary to find, process and analyze data from a variety of sources. The learners can evaluate the consistency and accuracy of the data; plan, organize and set the goals independently; work with databases and information systems; master scientific research methods and techniques; create, design and implement the application of research findings in the field of psychology and pedagogy. One of the main advantages of non-formal educations is the development of students' metacognitive skills, critical thinking, creativity, self-regulation. Students of the educational program "Pedagogy and psychology" found the content of the courses relevant and their motivation increased, which positively affected on students' academic performance in formal learning. Students of the experimental group, who participated in massive open online courses on the Coursera platform, showed greater independence that help them to improve their academic achievements. Self-regulation in online courses make learners more successful (Wang et al. 2013). However, some students from the experimental group could not boost their mid-term results after completing online courses. Some learners struggle to engage success in metacognitive abilities in a short period of time (Bol & Garner, 2011).

We agree that MOOCs on the Coursera platform are tailored to student individuality, personalized learning experiences and a supportive learning environment that develop self-awareness and self-regulation (Jansen et al., 2020). The benefits of non-formal education are obvious, but there are some challenges that learners, teaching staff and university administration can face. First of all, the variety of online courses can lead to different learning results. Second of all, the organization of non-formal education requires an effective coordination and collaboration of all participants. Finally, it is crucial to develop transparent evaluation mechanisms to assess the course results (Souto-Otero, 2021).

Conclusion. According to our research, the organization of non-formal education through massive open online courses on the Coursera platform have a great impact on improving students' academic achievement. The students of experimental group received certificates of accomplishment after completing 4 MOOCs: "Leading teams: Building Effective Team Cultures", "Effective Problem Solving and Decision Making", "Project Management: The Basics for Success" and "Successful Negotiation: Essential Strategies and Skills". After pedagogical experiment the level of academic performance of the control group increased by 6,3%, and the experimental group grew by 15,6%. As a result, a regional pedagogical university's educational policy includes non-formal education as well. A review of literature on the problem of the demonstrates that the organization of non-formal education is still actively developing in practice. Thus, massive open online courses are utilized as alternative and independent sources of information, they can be useful instruments for fostering non-formal education. The flexibility of non-formal education allows students to choose their own learning routes and build professional strategies according to their interests and needs.

To optimize the usage of massive open online courses on the Coursera platform and to develop certain skills and abilities the authors of this research recommend the following:

1) the advisers of the educational programs should organize non-formal education so that students could select online courses on the Coursera platform thoroughly according to their interests and professional strategies, covering educational psychology, teaching technologies and other related subjects;

2) the number of courses from well-known and reputable universities should be expanded for future teachers;

3) it is recommended to collaborate with other course learners through forums and discussion boards to build a professional network and share perspectives;

4) it is crucial to recognize and validate the results and competencies of non-formal education by the universities.

The outcomes of the study verify the

effectiveness of the organization of non-formal education for students of the educational program "Pedagogy and Psychology" and including massive open online courses on the Coursera platform into the educational process of a regional university.

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ACCOMPANYING A STUDENT WITH AUTISM SPECTRUM DISORDER IN SCHOOLS IN KAZAKHSTAN: THE ROLE OF A TEACHER ASSISTANT

Abstract

Worldwide, the development of inclusive education is aimed to achieve the goal of creating safe, non-violent, inclusive and effective learning environment for all children. The goal of our work is to study the current situation of teaching assistants in supporting children with autism spectrum disorder in secondary schools. A questionnaire was developed by the team of experts and is based on the legal acts. It is designed in two main