

Non-Formal Education: Dynamics of Changes in the Popularity of Mass Open Online Courses

N. Dehtiarova*, O. Zhmud**, V. Makarova*, O. Hontar*, M. Zakharevych**

* Sumy State Pedagogical University named after A.C. Makarenko, Sumy, Ukraine

**Pavlo Tychyna Uman State Pedagogical University, Uman, Ukraine

degtyarevanv@fizmatsspu.sumy.ua, o.v.zhmud@gmail.com, vikaodinstova@gmail.com,

helenhontar18@gmail.com, zakharuman@gmail.com

Abstract - Urgency and peculiarities of the integration of formal and non-formal education forms were considered in the article. Conscious assimilation of knowledge when integrating non-formal courses into the educational process of the university on the basis of experimental research was proven.

Results of a survey of more than 200 respondents from different cities of Ukraine regarding non-formal education in 2021 and 2022 were analyzed. Dynamics of changes in relation to non-formal education in peacetime and during military operations were presented. Recommendations for taking into account the student's learning results during non-formal education were summarized.

Keywords - non-formal education, mass open online courses, computer in education, self-education, lifelong studying.

I. INTRODUCTION

Education in Ukraine and in the whole world has begun to change. The pandemic has caused the transition to distance form of education for pupils/students. New professions appear on the labor market. Those professions that already exist are updated in such a way that the skills or knowledge acquired by a specialist become out-dated. Retraining should be quick and meaningful. Now the specialist needs clear knowledge, which he needs just today. In this way, demand and supply in the field of non-formal education were formulated.

Pupils, students and adults combine non-formal and formal education today. Massive open online courses (MOOC) are among the most in-demand forms of non-formal education. The first courses were created on the basis of educational institutions - the University of Prince Edward Island, Stanford, and others. Therefore, in the future, MOOC will be created with the support of universities or public organizations. Courses are becoming increasingly popular in Ukraine as well. The authors of this paper conducted research in 2021 on the awareness of lecturers and students about various courses available in the country, planning to further analyze the demand for courses by areas and offer students to develop a course according to certain criteria. However, the war has changed the direction of research. In the conditions of military operations, studying has become more difficult. Therefore, a survey was conducted in December 2022 - at the beginning of January 2023 in the same institutions that

were used as a base for the questionnaire in 2021. And the results were compared.

A large number of studies and scientific publications are dedicated to the problem of MOOC. S.J. Blackmon, C.H. Major considered the issues of the essence of MOOC, their variations and offered their own vision of their typology [1]. U. Nazir, H. Davis, and L. Harris studied motivation for studying and indicators of MOOC courses completion by the participants [2]. Quantitative analysis of IT courses was developed by O. Semenikhina, A. Yurchenko, A. Sbruieva, A. Kuzminskyi, et al. [3;4].

The purpose of this article was to identify the current state of MOOC demand and analyze its efficiency in difficult conditions.

Research tasks:

- publication of the questionnaire results of 2021 and December 2022 - January 2023;
- identifying the dynamics of changing attitudes towards MOOC;
- experimental checking of the efficiency of MOOC courses completing in difficult conditions.

The authors conducted a survey at the beginning of the experiment. This provided information on attitude towards non-formal education and MOOC courses. The next step was a knowledge check in the discipline "Digital Technologies". After that, students were recommended to take a course in which they acquired skills in working with text, electronic tables, and algorithmic structures. These skills extended studying on the university's course "Digital Technologies". Students chose the course independently and agreed with the teacher. This was necessary so that the skills that were formed and subsequently evaluated would be approximately the same. If the student chose a course that did not have all the necessary materials and tasks, the teacher recommended several courses to choose from. The following stage was a control check and comparison with the results at the beginning of the experiment.

Therefore, this publication presents the results of the questionnaire, which demonstrate the awareness and attitude of teachers and students to MOOC. The questionnaire was conducted in 2021 and in December 2022 – January 2023. Changes taken place over the past 1.5 years were analyzed in the article. In addition, it should be taken into account that in 2022 the war started in Ukraine and the conditions of education became

difficult. Then the results of the experiment conducted between these two surveys were presented. Such an experiment demonstrated that MOOC courses are support of formal education in various conditions.

II. DYNAMICS OF ATTITUDES TO MASS OPEN COURSES ACCORDING TO QUESTIONNAIRE RESULTS FROM 2021 AND DECEMBER 2022 - JANUARY 2023

The questionnaire was conducted on the basis of Sumy State Pedagogical University named after A.S. Makarenko, Pavlo Tychyna Uman State Pedagogical University, Kremenets Regional Humanitarian and Pedagogical Academy named after Taras Shevchenko, schools of Sumy, Uman, Kremenets, Kyiv and urban villages. The survey was conducted using Google Forms. 205 respondents took part in 2021; there were 215 respondents in December 2022 - January 2023. Each questionnaire contained 15 questions. The number of students, lecturers and other specialists among them was distributed in the way shown in the diagram (Fig. 1).

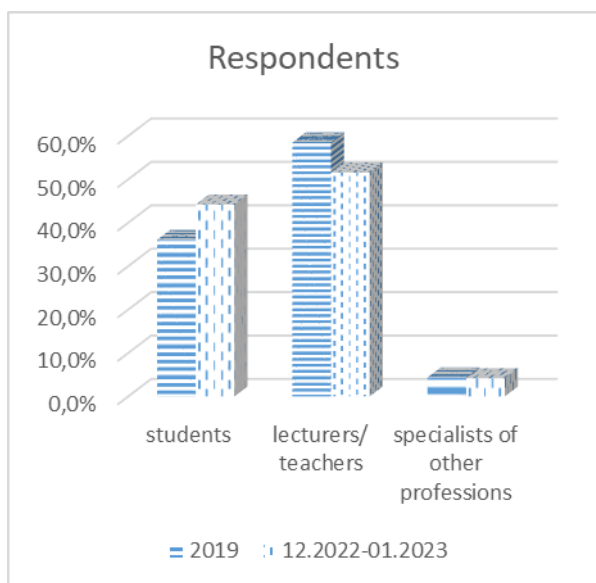


Figure 1. Distribution of the number of students, lecturers and other specialists taken part in the survey

The following answers to the question “Do you know what non-formal education is?” were offered:

- “yes, I completely understand”;
- “I have a rough idea”;
- “no, I don't know what it is”.

The number of respondents who fully understood the concept of non-formal education increased from 42.9% to 44.2%. The number of respondents who had a rough idea also increased by 47.9% (data of 2022, January 2023) compared to 44.9% (2021). The number of respondents who were not interested in non-formal education decreased from 12.2% to 7.9%.

One of the questions of this questionnaire was the following: “Has your attitude to studying changed since

the start of Russia's war against Ukraine?” And 68.9% of the respondents (which were 144 people out of 215) answered that “now it is necessary to value the opportunity to study more”. 21.5% of the respondents did not change their attitude, 7.2% chose the answer that the main thing was “now it is not time for studying, you can study later”. The results of the answer to the question “Did you take courses in 2022 or are you taking them now?” were also indicative. 78.6% answered “Yes”, which means that 169 people out of 215 are engaged in self-development in difficult conditions.

The next block of questions revealed the opinion of the interviewees about massive open online courses. Prometheus, Diia. Digital Education, Coursera turned out to be the most famous for this category of respondents. These categories were chosen by the most respondents at both stages of the survey. In 2022-2023 survey, the number of respondents who learned about EdEra increased. Prometheus, Diia. Digital education, EdEra are Ukrainian platforms where mostly free courses in various fields are located. Paid courses are also offered among Prometheus MOOC.

Distribution of answers to the question “Which device do you use most often for studying and taking courses?” is shown below (Fig.2)

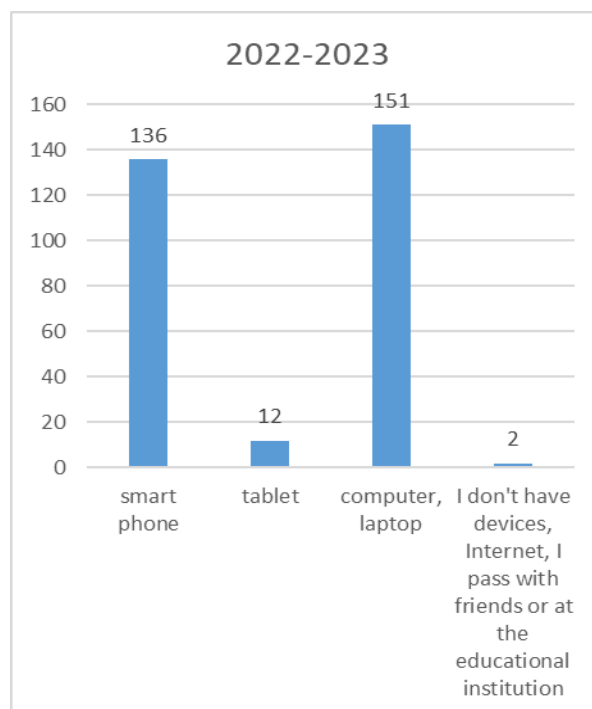


Figure 2. Use of different devices

Various cities and urban villages were chosen for the survey:

- Kyiv which is the capital of Ukraine with a population of more than 2.8 million,
- Sumy which is a regional city with a population of over 260 000,
- Uman which is an administrative center of Uman district with a population of about 82 thousand,

- Kremenets which is a small town in Ternopil region with a population of less than 21 000,
- small towns and urban villages of Sumy region and Uman district, the population of which could be no more than 3-5 thousand people.

Only 2 respondents out of 215 had problems with access to the device or network, and over 50% had several devices with the help of which they had the possibility to study. This fact gave grounds for asserting that the problem of access to courses in cities was not significant.

The vast majority chose “their own desire” and “self-education” as the reasons for taking the course: 54.5% (2022-January 2023) and 46.4% (2021). Other reasons included “a requirement/recommendation by the place of study or work”, “curiosity” and other reasons.

The second stage of the survey (2022 - January 2023) included questions about the form of education. 111 respondents (53%) considered it appropriate to return exclusively to full-time education under the right conditions, 77 participants (37%) considered it appropriate to remain blended learning, the rest could not decide. A total of 209 people answered this question. The question and the distribution of answers are shown in the figure (Fig. 3).

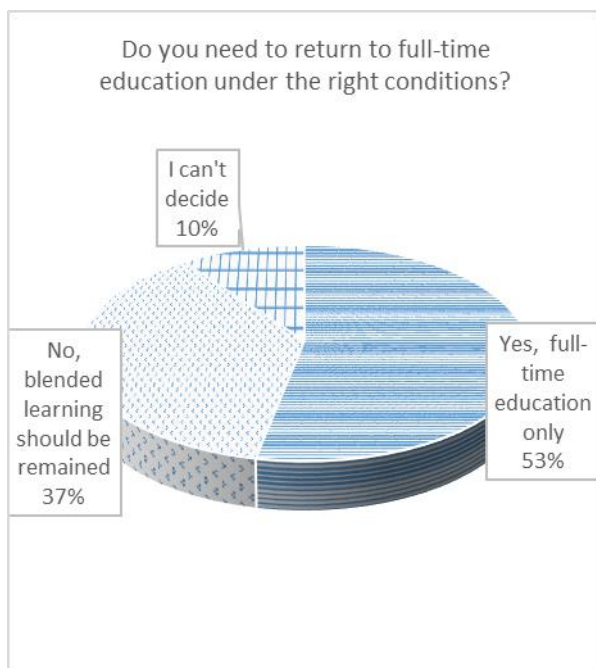


Figure 3. Choosing the form of studying by respondents

At the same time, 55.3% of respondents considered full-time studying to be the most effective, and 32.7% of respondents considered blended learning to be the most effective one. Others mentioned exclusively distance studying and self-education. No one chose “family education” option.

Thus, non-formal education is gradually taking its place in continuous lifelong education. Everything goes quite harmoniously when an adult expands his

competences with the help of MOOC. It appears inconsistency in the case when a student has completed a certain course, acquired knowledge and skills, and has no desire to take the same course in the educational institution. Differences between courses by rating were studied by Gamage D., Perera I., Fernando S. The authors concluded that courses with a higher rating do not differ in content, but such courses are easy to understand, with a good material presentation. Students choose courses based on their intuition. The authors note that some developers do not pay much attention to design or methodological issues when creating, but only improve courses in the future according to comments [5]. The lecturer must determine whether there is a correspondence in the theoretical material, or whether the skills that were expected as a result of studying have been formed. The lecturer must recognize or not recognize the results and justify it. And here the problems that need to be solved now are formulated:

- a clear coordinated process of integrating non-formal education into formal education is needed;
- a procedure for determining the criteria for taking into account knowledge and skills acquired in non-formal education when evaluating the results of studying is needed;
- the fact that determining the features of the choice of platforms and courses depends on the student is important, but the lecturer is not obliged to know the level of teaching in all courses of all platforms;
- there is a problem of psychological readiness of lecturers themselves to accept non-formal education of students;
- the student must be responsible for the quality of knowledge acquisition.

Everything that has been mentioned is also supported by the studies of other scientists. Lazarus Fc. and Suryasen. R. studied the problem of implementing MOOC in the education of developing countries. The authors, based on an in-depth analysis, note that the higher the penetration of MOOC, the greater will be the improvement in the quality of higher education [6]. Thus, the fact that the introduction of courses, in particular, and non-formal education in general is relevant in Ukraine, is an important factor in improving the quality of education.

III. DESCRIPTION OF THE RESEARCH AND ITS RESULTS

In this context, students - future computer science teachers were offered to take courses of their choice. Two groups at Sumy State Pedagogical University named after A.S. Makarenko and Pavlo Tychyna Uman State Pedagogical University to evaluate the efficiency of MOOC integration into formal activities were formed. Students of both groups had statistically the same studying results. The experimental group (EG) included 25 students. It consisted of 12 students of the 4th year of Bachelor training and 13 students of the 1st year of Master's degree. The control group (CG) consisted of 24 students, including 12 students of the 4th year of Bachelor

training and 12 students of the 1st year of Master's degree. Determination of efficiency was carried out based on the evaluation of theoretical knowledge, practical skills and reflective perception of the student's own result. Students chose a platform and a course by their own will that corresponded to the acquisition of skills in a specific discipline. The ability to work with text documents, tabular data, and algorithmic structures was evaluated. Control was carried out at the beginning and at the end of the course. It included testing from the theoretical part, performing of practical tasks. This part was evaluated by the lecturer. In addition, reflection was a separate criterion: a conversation and a survey of students regarding the level of awareness of their own knowledge. It should be noted that reflection indicators were a subjective evaluation of students. Surveys for Bachelor's and Master's students were different, according to their disciplines.

The results were expressed in the levels of high, sufficient, medium, and low. Obtained results were presented in Table 1,2.

TABLE I. RESULTS OF THE TASKS AT THE BEGINNING AND AT THE END OF THE EXPERIMENT (Experimental group)

Crite rion	Levels	Initial evaluation		Final evaluation		Changes	
		Num ber	in %	Num ber	in %	Num ber	in %
Theoretical knowledge	High	2	8	5	20	3	12
	Sufficient	8	32	11	44	3	12
	Medium	10	40	8	32	-2	-8
	Low	5	20	1	4	-4	-16
Total:		25	100	25	100		
Practical skills	High	3	12	6	24	3	12
	Sufficient	8	32	12	48	4	16
	Medium	9	36	7	28	-2	-8
	Low	5	20	0	0	-5	-20
Total:		25	100	25	100		
Reflection	High	0	0	5	20	5	20
	Sufficient	10	40	12	48	2	8
	Medium	12	48	8	32	-4	-16
	Low	3	12	0	0	-3	-12
Total:		25	100	25	100		

TABLE II. RESULTS OF THE TASKS AT THE BEGINNING AND AT THE END OF THE EXPERIMENT (Control group)

Crite rion	Levels	Initial evaluation		Final evaluation		Changes	
		Num ber	in %	Num ber	in %	Num ber	in %
Theoreti cal knowled	High	1	4,2	3	12,5	2	8,3
	Sufficient	8	33,3	9	37,5	1	4,2

	Medium	11	45,8	10	41,7	-1	-4,2
	Low	4	16,7	2	8,3	-2	-8,3
Total:		24	100	24	100		
Practical skills	High	2	8,3	3	12,5	1	4,2
	Sufficient	8	33,3	10	41,7	2	8,3
	Medium	10	41,7	10	41,7	0	0,0
	Low	4	16,7	1	4,2	-3	-12,5
Total:		24	100,0	24	100		
Reflection	High	1	4,2	3	12,5	2	8,3
	Sufficient	10	41,7	10	41,7	0	0,0
	Medium	10	41,7	10	41,7	0	0,0
	Low	3	12,5	1	4,2	-2	-8,3
Total:		24	100	24	100		

Given data showed that the increase in the number of students in the experimental group who passed to a high and sufficient level and a decrease in their number in the medium and low level indicated the efficiency of the integration of non-formal education into formal one. Comparing changes that occurred in EG and CG also confirmed this fact. Such changes were more obvious for the experimental group.

We believe that experimental confirmation of the efficiency of integrating of non-formal education, namely MOOC, into formal one has taken place. After carrying out the experiment and analyzing obtained results, we can formulate the following recommendations. It is advisable to recommend courses for students to a lecturer who understands before the start of the course whether theoretical topics are included and whether practical tasks are proposed that are close to the planned ones. The lecturer clearly formulates the criteria for evaluating studying results. The lecturer, studying the courses, can expand his own competences, find more appropriate teaching methods, more successful examples. The lecturer must be ready for conflict situations. For example, a student completed a certain course without consulting the lecturer. Such a course has a related title, but the knowledge that the student gained there is lower in level. At the beginning of his discipline, the lecturer should present the syllabus to the students, where the requirements for the level of knowledge and the criteria for their evaluation are clearly described. The student must confirm the acquired knowledge and skills in the interview or by another evaluation method (testing, performing a practical task, etc.)

IV. CONCLUSION

Non-formal education is in demand. The reasons for the demand for mass open online courses are the lack of consistency of the proposed content of education in educational institutions with modern requirements for the competencies of graduate students [7]. Therefore, it gradually occupies its niche. The results of the research presented above confirm that many young people have a desire for self-development. At the same time, it does not

matter if they live in a big city or not. Access to online courses makes it possible for young people to develop in the direction they choose.

An online course cannot replace a comprehensive education. Education consists not only in the acquisition of skills and knowledge, but also in socialization, exchange of experience, formation of soft skills. Studying should be a social experience, not the interaction between a person and devices [8].

When integrating elements of non-formal education into the education process at the university, it is necessary for the teacher to control the process. He can determine the quality of material presentation and its relevance to the discipline.

The most appropriate element of non-formal education that can be implemented in institutions of higher education is massive open online courses. And this is explained by the fact that the conditions for each student may be different. In conditions of a pandemic, war or other unavoidable circumstances, access to institutions is limited for a certain time. And in order not to lose time and opportunities, it is important for a young person to continue to develop, to form his own competencies and experience.

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