A Research on Massive Open Online Course Design and Delivery

Valentina Dagiene, Danguole Rutkauskiene, Daina Gudoniene

Abstract: *The paper justifies the necessity to introduce to the society the Lithuanian case on massive open online course (MOOC) design and delivery. The problem is still available that academic society in Lithuania have no experience on the case and the research will help them to plan, to design to delivery and to provide MOOCs for wider society. The paper presents a research on the respondent's answers according to the questionnaire designed.*

Key words: *MOOC, research, education.*

INTRODUCTION

Open and online education are seen as innovation drivers to improve education and/or seen as the base for transformation of our (secondary and higher) educational system. For some people MOOCs are seen as an indicator that our higher educational system will change.

Many authors [1-4] are identifying MOOC as a massive open online course (MOOC) is an online course aimed at unlimited participation and open access via the web. In addition to traditional course materials such as videos, readings, and problem sets, MOOCs provide interactive user forums that help build a community for students, professors, and teaching assistants [5].

MOOCs are online courses designed for large numbers of participants, that can be accessed by anyone anywhere as long as they have an internet connection, are open to everyone without entry qualifications, and offer a full/complete course experience online for free (EADTU) [6-8].

The open sharing of content, tools, technologies, models, experiences, etc. creates new opportunities for innovation and incubation. More than in previous times universities can take in to account needs of business and public sectors and changes in students learning habits in the process of course or program development [9-11] . Open and online education are seen as innovation drivers to improve education and/or seen as the base for transformation of our (secondary and higher) educational system.

The main driver on open education on a national or global level is access to higher education for all [12-15]. It is perceived as extremely relevant and beneficial for Developing Countries and Emerging Economies with (1) shortage of qualified teachers; (2) lack of high-quality learning materials and (3) evident need to really expand access to (formal) education. Next it reduces the costs of HE at a state/country level (e.g., 50% reduction by use of open textbooks) [16]. As such Open Education, OER and MOOCs have become part of political arena (EU, Governments, UNESCO). However, the European answer to this is slowly and fragmented, and only some institutions and some countries are responding in announcing their own MOOC platforms.

At an institutional level the main driver on open education is (was) mainly marketing, offering something for free to attract more students [17-20]. But by now open education has become competition and demand driven. MOOCs for example are used in competition for (international) students.

The world of open and online education does change the way we innovate our education system, our programmes and courses [18, 19]. Leveraging open as an economic driver involves developing and delivering open products and services in partnership with others around Europe (and the world) [4-6]. Open education does change the relation universities [20, 21] holds with service providers (e.g., test and exam centres, publishers, providers platform), companies for training offers [22, 23], investors (to open education), governments and foundations.

Kaunas University of Technology – the largest technical university in Lithuania. Known for its linkages with business, leadership in scientific research, flexible interdisciplinary study programmes and unforgettable study experience, KTU is fast forwarding to becoming an internationally acknowledged institution of higher education.

KTU is delivering several post graduate distance education programs for more than 10 years and since 2013 has started to provide bachelor in Management completely at a distance. To experiment with MOOCs and to promote new distance education program, KTU has joined OpenupEd initiative of EADTU with MOOC on Management. There were registered over 1500 interested students, during the period of this MOOC delivery, were about 600 actually took part in the course activities and only 83 graduated with the certificate. We have created the special portal http://open.ktu.lt based on Moodle as our main platform for university offered MOOC's and we are expecting to provide with more open courses in 2014. At the national level we have initiated development of Moodle hub based platform http://open.liedm.lt were courses from http://open.ktu.lt and other universities will be promoted. In order to push forward promotion of open education resources we are planning to develop OER repository integrated with user friendly content development and sharing tools. As far as most of the Lithuanian academic institutions using Moodle as their platform of choice, we are working on the development of several Moodle modules meant to help MOOCs authoring and administration (e.g. Moodle module for integration of institutional Moodle platform with Video Presentation System http://vips.liedm.lt is supposed to help teachers easily broadcast and record lectures straight from Moodle, some other Moodle modules for learning analytics are also in the development by the partners of LieDM consortia).

The aim of the paper is to present the research carried out in Lithuania during the testing first Lithuanian massive open online course "Information technologies" to the wide society.

RESEARCH DATA ANALYSIS

Massive Open Online Courses (MOOCs) have been popular for quite some time now [24, 25]. A lot of people from other countries use this model to learn [26]. With the help of this convenient and completely free learning model, it is easier to gain knowledge and learn via internet [27-29]. The course in Lithuania was organized for the first time. For this reason, the investigation was held to reveal the opinion of learners about this type of learning courses in order to see what could be improved or changed.

In total, 2009 participants took part in this course from which 300 learners successfully completed the course. All respondents were awarded with certifications. The majority of respondents who participated in MOOCs "Information Technologies" course fell into the age group between 26 to 60 years. After the analysis of the results of questionnaire it came clear that the majority of learners who completed questionnaire are 26 – 60 years old (92% of all respondents). The youngest group included 1% of all respondents who are younger than 18 years old. 18 – 25 age group included 4% of all respondents. The oldest group which included 61 years and more had 3% of all respondents. Such distribution show a huge interest of youngsters and middle-aged people in information technologies. It only confirms that this group is interested in new technologies, although the lack of theoretical and practical knowledge is clearly seen.

The majority of respondents have a higher education degree. After a thorough analysis of questionnaire the results revealed that the majority of respondents (90%) indicated they are highly educated. Advanced vocational education and training, post-secondary education, secondary education or not finished secondary education had 2% of all respondents respectively. Such statistic measures lead to the conclusion that more educated people tend to gain more knowledge in different areas.

The majority of respondents in MOOCs are school teachers. After analyzing the answers of respondents the results revealed that the majority of respondents are teachers.

46% of respondents chose this answer. 15% of these respondents are representatives of other educational institutions. 10% indicated they represent administrative staff. 8% are higher education representatives of pedagogy. 6% respondents are representatives of different professions: "psychologist", "not working", "in childcare", "school speech therapist", "study mentor", "student and specialist", "supervisor of education development centre", "security guard", "pensioner", "state official", "specialist". 5% indicated they belong to the group of servants. 4% stated they are students. Workers, unemployed and school students are 2% of all respondents. Such distribution leads to the conclusion that "Information technologies" course is relevant for participants who work in educational institutions. It may also suggest that MOOCs was more integrated among higher institutions.

The majority of MOOCs respondents are from Lithuania. In order to reveal the residence of respondents, an additional question was asked to reveal the exact place of residence. After the data analysis it is clear that the majority of respondents (97%) are from Lithuania. Only 3% indicated other place of residence: Cyprus, Ireland, UK. It is obvious that Lithuanian respondents had the possibility to get more information about MOOCs.

COMPETENCES DEVELOPMENT IN MOOC

Information about MOOCs "Information technologies" was widely spread using internet and other recommendations. In order to examine the effectiveness of MOOCs "Information technologies" dissemination, respondents were asked to reveal how did they get the information about MOOCs. Results show a variety of dissemination forms. (see Table 1).

Table 1. „Information Technologies" dissemination of information

Category	Sub-category	Example
Internet technology	E-mail (43)	Over informational e-mail; School officials sent an invitation e-mail to participate in MOOCs; I was informed via Virtual Learning Environment; I read the invitation and got interested; I am thankful for the invitation letter to participate in MOOCs.
	Websites (46)	From the website; I got the information from "Ugdymo sodas" website; I found information on open.ktu.lt but did not know about the registration. Later I participated in KTU courses and found out more; from other website.
	Social networks (11)	"E-mokykla" website shared this information on Facebook; randomly saw advertisement on Facebook; IT teachers Facebook group; Advertisement on Facebook.
	VLE (1)	Virtual Learning Environment.
	Intranet (1)	Institution's intranet.
Press	Online press (2)	Internet blogs; random message on online newspaper and references from articles, because there were no information on search websites.
	Printed sources (1)	Press.
Direct dissemination	Colleagues(14)	I got the link from my colleague psychologist; colleague sent information via e-mail; from colleague at work; from co-worker;
	Friends(6)	Friends; friend recommended and I thought this would be a perfect possibility to gain more knowledge in IT; friend gave me a link to the

		website, because she studied in KUT and still gets all the latest news.
	Family members (3)	From sister; my mother works in school – that is how I found out;
	Teachers/Lecturers (8)	From my group lecturer in Šiauliai vocational education and training centre; IT teacher suggested; IT lecturer informed and suggested to participate.
	Work administration (23)	From school administration; from work; I found out after I got an e-mail from Vilnius College administration saying everyone can participate.
Advertising	Advertisements (2)	From advertisement on school advertisement board; from KUT advertisement.
	Online advertisements (1)	Advertisement online.

Internet technologies helped a lot to spread the information about MOOCs. A lot of respondents stated that they knew about the course from an e-mail inviting them to participate. It ensures that learner will notice the message and will not be lost among other messages. Most of respondents found out about MOOCs from social media networks (see Table 1).

MOOCs definition is not easily understood and many have not even heard about it. In order to understand MOOCs popularity, respondents were asked to say if they knew anything about MOOCs. The results show that most of respondents (54%) have never heard of this term (see Figure 1). 25% of respondents have heard of it but cannot provide a definition. 21% of respondents they know exactly what MOOCs and can give a definition. It gives the idea that MOOCs definition as well as the action itself is a new phenomenon people have not heard about.

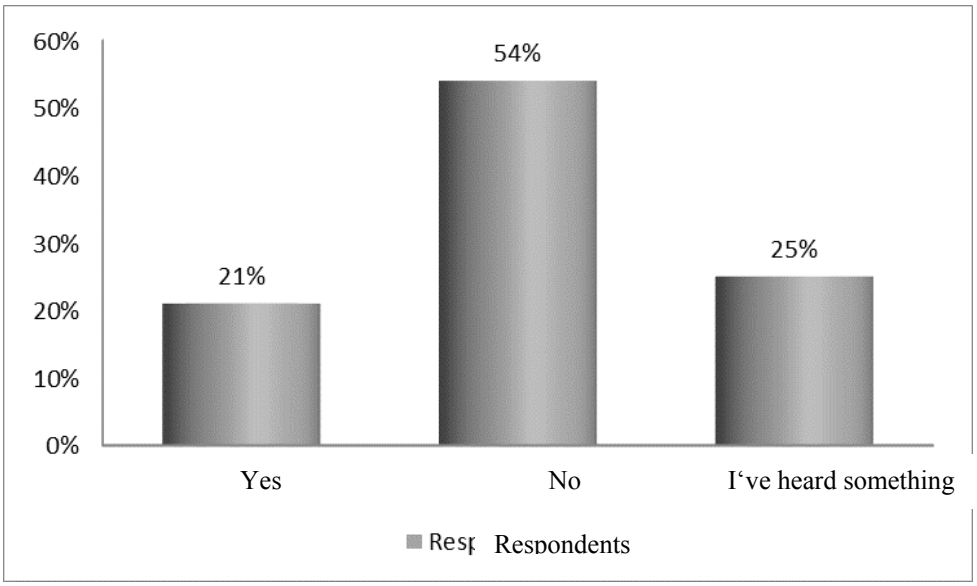

Fig. 1. Respondents knowledge about MOOCs

Distinctive set of criteria are not known very well. In order to reveal the differences of MOOCs and other learning resources, respondents were asked to identify several distinctive criteria. 53% of respondents can identify several criteria, but not completely (see Figure 2). 31% of respondents claimed they do not know any distinctive criteria and only 16% can identify them all. The results show that learners can identify several criteria but not accurately and completely.

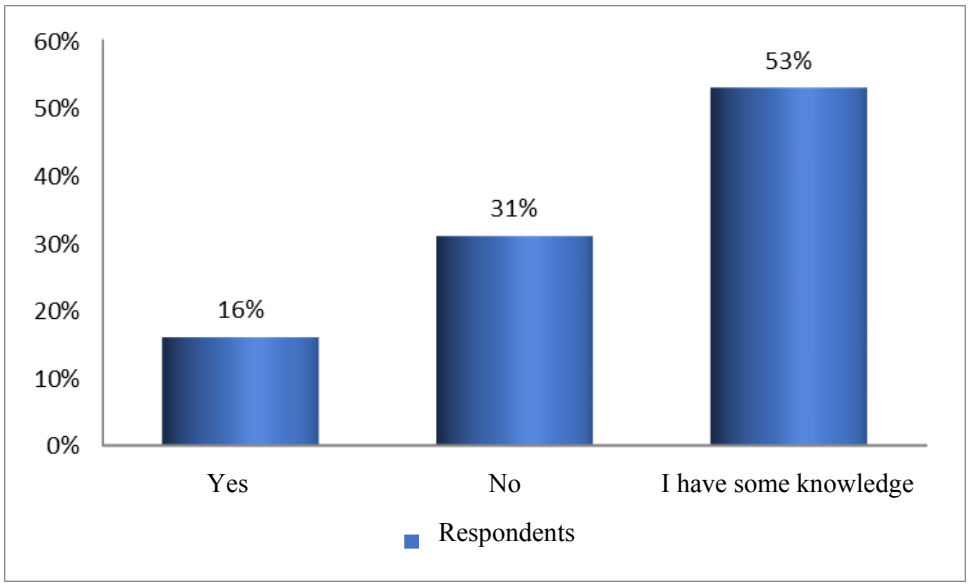

Fig. 2. Knowledge of MOOCs distinctive criteria

The majority of learners were beginners who are participating in MOOCs for the first time. In order to reveal the knowledge of participants in MOOCs, they were asked about the participation in other e-environment courses. The results showed that the majority of respondents (86%) have never participated in such courses earlier and this is their first experience. The rest of respondents (14%) have participated in such courses earlier and this is not their first time. The results show that MOOCs are not popular and well-known. For this reason only several people have participated in such courses.

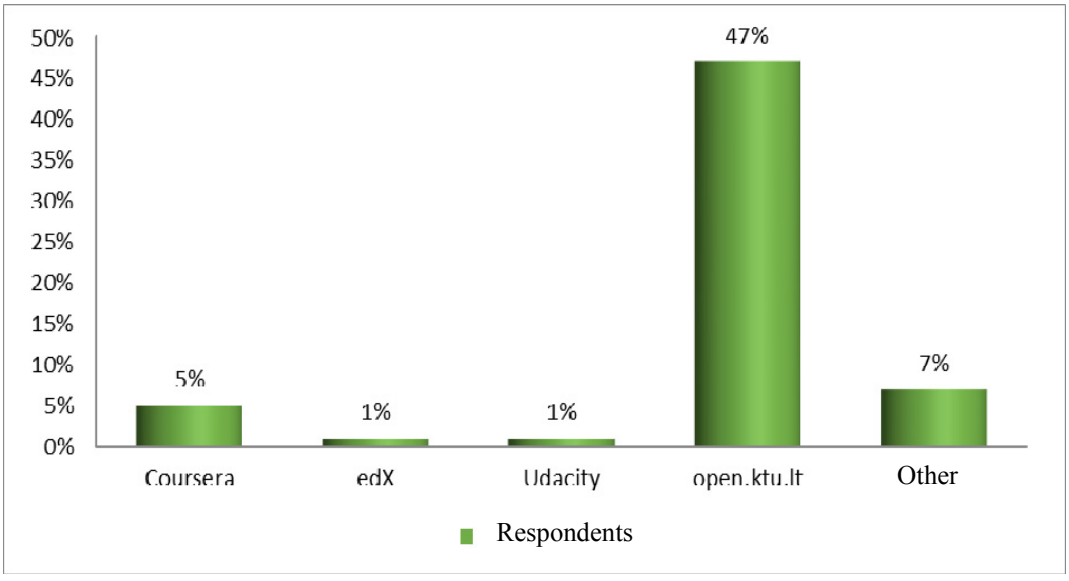

Fig. 3. Respondents participation in MOOCs

The majority of respondents participated in open.ktu.lt MOOCs. For this reason it was essential to understand what kind of experience respondents have with other organizations. Results revealed that the majority of respondents participated in open.ktu.lt MOOCs. This answer was chosen by 47% of all respondents. 5% of them have participated in Coursera MOOCs (see Figure 3). 1% of respondents took part in edX and Udacity MOOCs respectively.

LEARNING CONTENT IMPORTANCE FOR COMPETENCES DEVELOPMENT

Respondents indicated what motivated them to participate in MOOCs "Information Technologies". In order to understand what motivation models had the biggest impact in MOOCs participation respondents were asked to evaluate the given statements from 1 to 5.

Advertisement of the course was not the most important factor in choosing MOOCs. In order to reveal how advertisement affected the decision to participate in MOOCs, respondents were asked to evaluate the question part of well-publicized course. The majority of respondents (29%) gave 3 points (see Figure 4). Little less, 28% gave 4 points and 15% gave 2 points to the well-publicized course. Accordingly, 14% of respondents gave 1 and 5 points.

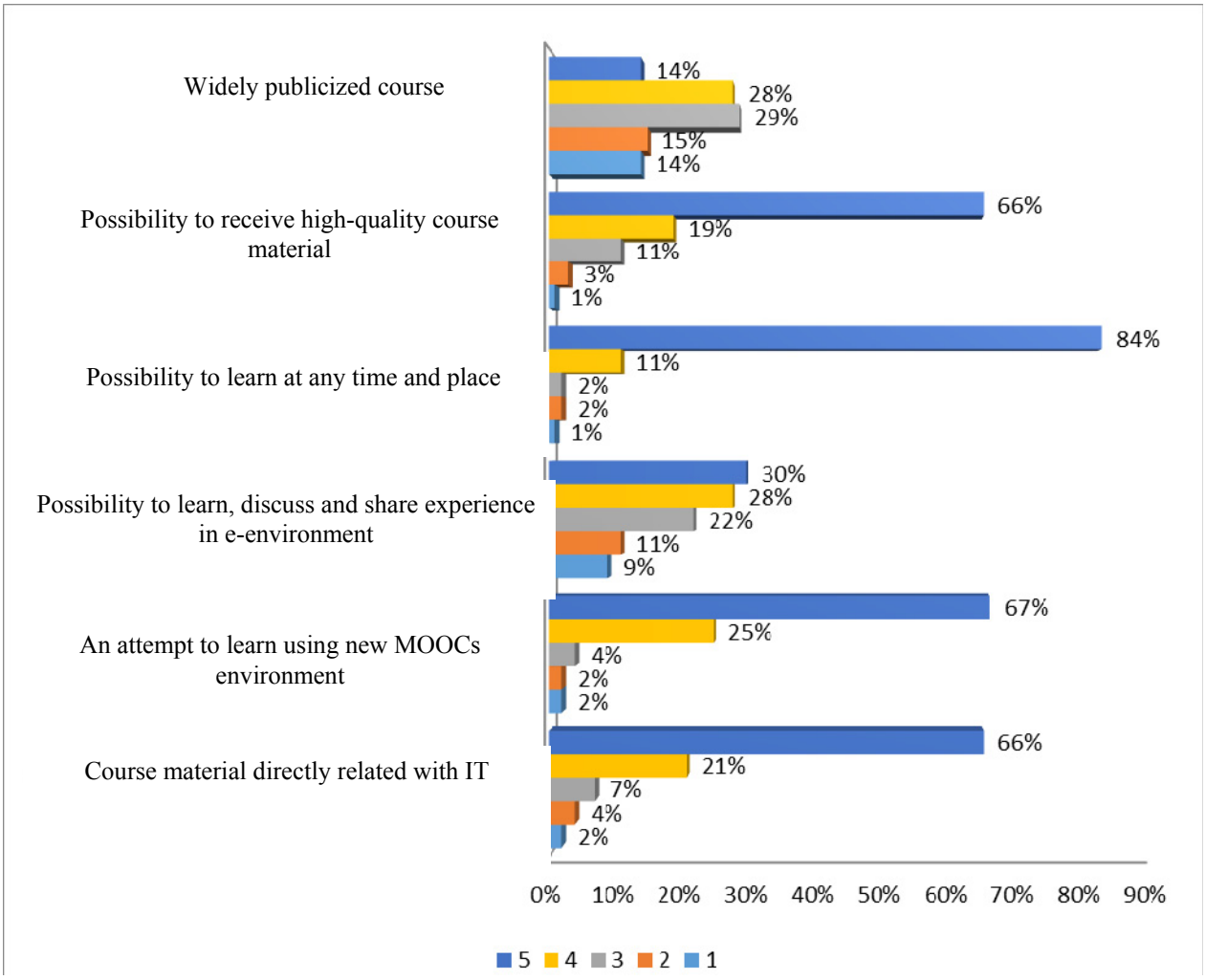

Fig. 4. Motivation models which helped to choose MOOCs „Information Technologies"

Possibility to receive high-quality course material for free was a good motivation which helped to participate in MOOCs. 66% of respondents evaluated this question part by highest mark, i.e. 5 (see Figure 4). 4 points were given by 19% of respondents, 11% participants evaluated it by giving 3 points, 2 points were given by 3% and 1 point was given by 1% of respondents.

Possibility to learn at any place and time was a huge advantage in taking the course in e-environment. 84% of all respondents who completed questionnaire said that this possibility played a significant role in choosing MOOCs. 11% of respondents gave 4 points to this part of the question, 2% gave 3 and 2 points. 1% gave it only 1 point.

Respondents evaluated the possibility to discuss and share experience in e-environment positively. 30% evaluated it giving 5 points, 28% gave 4 points, 22% gave 3

points, 11% of respondents gave 2 points and the lowest evaluation was given by 9% of respondents.

Taking MOOCs was a good motivation for learners to participate in course. "An attempt to learn using new MOOCs environment" chose the majority of respondents (67%) and evaluated it 5 points (see Figure 4). 25% of respondents gave 4 points, 4% gave 3 points. Accordingly 2% of respondents gave 2 and 1 point for this motivational model.

The fact that course material was related with IT motivated the majority of respondents to be a part of MOOCs. This motivational statement chose 66% of respondents giving it 5 points (see Figure 4). 21% of respondents gave 4 points, 4% gave 2 points and the rest 2% of respondents evaluated it giving only 1 point.

After analyzing the results it can be stated that the biggest influence on respondent's choice to participate in MOOCs had the fact that courses can be taken at any place and time without going out anywhere and respondents had the access to all the necessary course material. It only shows that learners are keen to gain more knowledge and are eager to learn using new motivation models.

From all models, MOOCs has the best evaluation. In order to get the best understanding about learning methods, respondents were asked to evaluate all of them from 1 to 5.

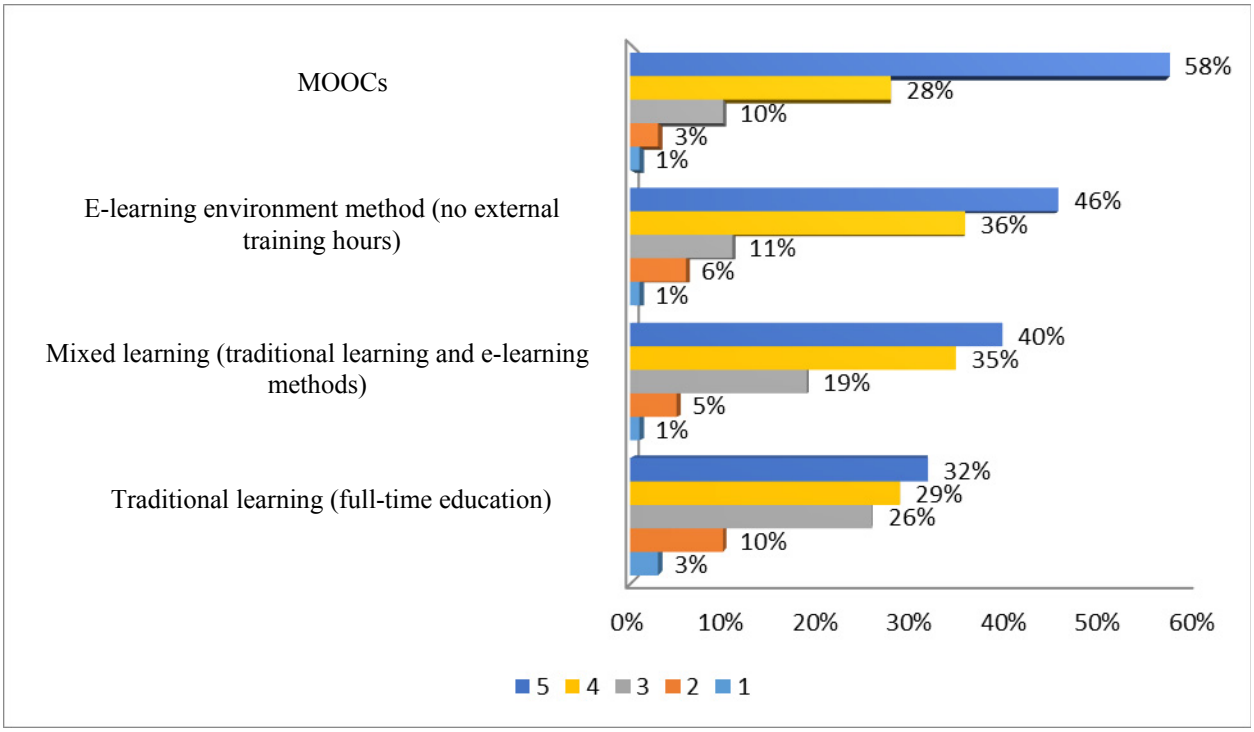

Fig. 5. Evaluation of learning methods

According to respondents, MOOCs is a well-established learning method which meets all the requirements and needs presented by learners. 58% of respondents evaluated it giving 5 points (see Figure 5). 28% gave 4 points, 10% gave 3 points. 3% of respondents evaluated it giving 2 points and 1% of respondents gave 1 point.

Respondents also positively welcomes e-learning environment method with no external training hours. 46% of respondents gave 5 points, 36% gave 4 points, 11% gave 3 points, 6% gave 2 points. Only 1% of respondents evaluated learning model by giving it 1 point.

Mixed learning, when traditional learning is connected with e-learning does not have such a positive evaluation as previous methods. 40% of respondents gave 5 points (see Figure 5), 35% gave 4 points, 19% of respondents who completed questionnaire gave 3 points. 5% gave 2 points and 1% gave 1 point.

Traditional learning method is not as popular as it used to be when there were no other alternatives. 32% of respondents evaluated traditional learning by 5, 29% gave 4 points, 26% gave 3 points, 10 gave 2 points and 3% of respondents gave 1 point.

MOOC EXPLOITATION AND EVALUATION

After the summary of research findings it can be stated that e-learning environment method is evaluated positively because of the possibility to harmonize learning and everyday life. Traditional and mixed learning methods among adult learners are not evaluated as effective and convenient learning methods.

Table 2. MOOCs disadvantages in comparison with traditional learning methods

Category	Sub-category	Example
No disadvantages (38)		I don't see any drawbacks; I haven't noticed any major disadvantages; there are no disadvantages, only advantages.
Disadvantages	Personal qualities (1)	Self-discipline.
	Communication (30)	No direct communication with lecturer; sometimes you have to wait longer for the answer to the question of find out by yourself. In traditional learning you get the answer immediately.
	Evaluation system (3)	Website evaluation system seemed like inadequate, because every person evaluated it according to different criteria.
	Learning organization (6)	Lack of differentiation; I don't see any huge disadvantages, only some organizational issues (the promised end date of courses was later than 18 December).
	Learning material (14)	A lot of material and little time to absorb all new information; course tasks are not directly related with course content.
	Certificates(5)	A bit pricy; some courses are cheaper than other;
	Technical characteristics (8)	Due to a huge number of participants sometimes it is hard to sign in for everyone at the same time and upload documents in the same website.

Comparing MOOCs with traditional courses, some disadvantages can be clearly seen. In order to reveal the real situation and see the difference between two different methods, respondents were asked to disclose and evaluate these learning methods. The results show that MOOCs have several different drawbacks (see Table 2).

A majority of respondents were asked about the disadvantages of MOOCs but could not identify any huge drawbacks. Respondents state that they do not see any major disadvantages. It only gives an opportunity to make an assumption that respondents who participate in MOOCs for the first time gain more experience and knowledge. For this reason, no major drawbacks can be identified.

CONCLUSIONS AND FUTURE WORK

The practical application of course "Information technologies" design and delivery was presented in the papers. The research data shows in the practical exercises on the course "Information Technologies" has led to the following conclusions:

MOOCs definition is not easily understood and many have not even heard about it. In order to understand MOOCs popularity, respondents were asked to say if they knew

anything about MOOCs. The results show that most of respondents (54%) have never heard of this term.

The main disadvantages were mentioned as no direct communication with lecturer; sometimes you have to wait longer for the answer to the question of find out by yourself. In traditional learning you get the answer immediately. Also respondents mentioned that not everyone like massive learning model, i.e. due to a huge number of participants sometimes it is hard to sign in for everyone at the same time and upload documents in the same website.

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ABOUT THE AUTHOR

Prof. Valentina Dagiene, Vilnius University Institute of Mathematics and Informatics, Vilnius, Phone: +370 698 05448, E-mail: valentina.dagiene@mii.vu.lt

Assoc.Prof. Danguole Rutkauskiene, Informatics Faculty, Kaunas University of Technology, Phone: +370 682 39200, E-mail: danguole.rutkauskiene@ktu.edu

PhD. Stud. Daina Gudoniene, Informatics Faculty, Kaunas University of Technology and Vilnius University Institute of Mathematics and Informatics, Phone +370 618 58604, E-mail: daina.gudoniene@ktu.edu

The paper has been reviewed.