

## MOOCS - TRANSFORMATION OF THE HIGHER EDUCATION PARADIGM

**Associate Professor Mariya Monova-Zheleva<sup>1</sup>, PhD**

*Faculty of Business Studies; mariaj@bfu.bg*

**Head lecturer Yanislav Zhelev<sup>2</sup>, PhD;**

*Faculty of Computer Science and Engineering; jelev@bfu.bg*

*<sup>1,2</sup>Burgas Free University, Bulgaria*

### Introduction

The Digital era has set new standards in our everyday life and work. To match the standards, the people of the Information society have to develop completely new skills and knowledge quickly. The rapid change of technology does not offer time to waste and everyone is required to race with it in order to keep their jobs and position and moreover to achieve successful carrier development [1] Alongside e-learning and open educational resources, massive open online courses (MOOCs) recently emerged in the higher education (HE) landscape providing additional learning opportunities for individuals, education institutions and academic staff. MOOCs are a paradigm that revolutionized corporate training and vocational education, providing opportunities for free education without preconditions or/and special conditions for learners. In this paper are discussed the problems associated with the development of such courses reflecting the specifics of the subject area, its dimensions and peculiarities in Bulgaria. The article presents some results obtained in the framework of a large-scale study conducted by the BizMOOC project [2], covering 106 qualitative interviews with experts from European organizations and Higher Education Institutions and 1193 survey responses from society/learners. Special attention is paid to the MOOC's potential for providing relevant, cost-effective, and flexible solutions for university training. The main results of the needs and gaps analysis are briefly presented in the context of the MOOCs related opportunities and challenges faced by the higher education institutions.

### The MOOC Paradigm

Rapid digital change in our society and economy means more demand for digital skills and competencies in all sectors. Education and training must address this need, which requires investment in infrastructure, training for teachers, organizational change and the development of high quality educational resources, including apps and software [3].

MOOCs have made headlines in education domain over the last years and generated a lot of discussion amongst educators, higher education institutions, government policy makers and private companies. No subject in educational technology in recent years has generated as much excitement and concern amongst the academic community as MOOCs. The media coverage, although somewhat diminishing, is huge compared to all other educational innovations in previous decades. It created interest of both private and public stakeholders resulting in serious investments [4].

Bates [5] specifies the essential elements behind each acronym of MOOC. Common in these definitions are the following aspects to give meaning to the elements of a MOOC:

- Massive: designed for in theory unlimited number of participants. This means that the course is designed in a way that the efforts of all services do not increase significantly as the participants' number increases.
- Open: access to the course is free without entry qualifications.
- Online: the full course is available through the internet.
- Course: the offering is a course, meaning that it offers a complete learning experience, i.e. structured around a set of learning goals in a defined area of study and includes the course materials, quizzes, feedback, examination and certificate of completion.

MOOCs have gained a lot of attention in recent years. MOOCs emerged as a new form of distance learning in line with other developments such as e-learning or open educational resources, which have been defined as „digitized materials offered freely and openly for educators, students and self-learners to use and reuse for teaching, learning and research” [6]. MOOCs are also seen as a medium for providing „relevant” job training courses to interested citizens who access them on the Internet. In this respect different programmes of the European Commission are important to notice. The Modernisation of Higher Education agenda amongst other aims at an inclusive digital learning for all - Europe's youth, workers and citizens - to get the knowledge and skills to work and live in the 21st century. Supporting Growth and Jobs: An Europe's Higher Education Systems for example states „... to reinforce digital skills and learning across society, with a view to empowering Europe's workforce and consumers for the digital era.“ Directorate-General for Education and Culture -European Commission already invests in different projects in their previous Lifelong Learning Programme and nowadays by Erasmus+, pilots and research related to MOOCs such as „Higher education Online: MOOCs the European way” [7], „BizMOOC is a knowledge alliance to enable a European-wide exploitation of the potential of MOOCs for the world of business” [2], „Support Centres for Open education and MOOCs in different Regions of Europe 2020” [8] and many more. In addition, MOOC projects like „European Multiple MOOC Aggregator” [9], „E-Learning Communication Open-Data” [10] and „Translation for Massive Open Online Courses” [11] are some of the all initiatives co-funded under H2020 and FP7 [4].

### **Current trends in the domain**

According to the information of Class Central [12] – the most popular search engine for free online courses and massive open online courses - MOOCs cover huge variety of topics but the majority of the registered MOOCs are addressed to the „Technology” domain in comparison with the previous year where the courses related to the „Business and Management” had the biggest share. Apart from this exception the distribution of courses across subjects has remained quite similar to last year as is shown on the next Figure (Fig. 1).

CLASS CENTRAL

Course Distribution by Subject



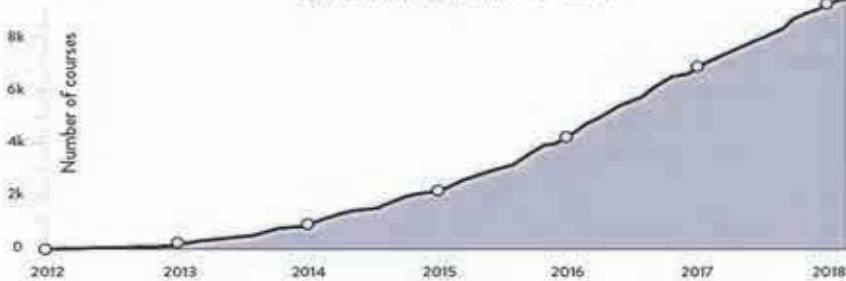
By the Numbers: MOOCs in 2017

Figure 1 Distribution of MOOCs by subject areas.  
Source: ClassCentral <https://www.class-central.com/report/mooc-stats-2017/>

Since their emergence in 2012, the number of registered users continuously increases year by year. For example in 2015 the number of MOOCs users is over 35 million [13]. According to the Class Central statistics, by the end of 2016, around 58 million students had signed up for at least one MOOC (ClassCentral, 2017). Around 23 million new learners signed up for their first MOOC in 2017, taking the total number of learners to 81 million. Although the growth in users is not fairly high last year, the number of new developed and launched courses increases very fast. To date, over 800 universities around the world have launched at least one MOOC. To launch their MOOCs usually the providers are partnering with companies (mostly in IT sector). According the Class Central analytics the total number of MOOCs that have been announced stands at 9,400, up from 6,850 in 2017 [14] as is shown on Fig 2.

CLASS CENTRAL

Growth of MOOCs



By the Numbers: MOOCs in 2017

Figure 2. Growth of MOOCs.  
Source: ClassCentral <https://www.class-central.com/moocs-year-in-review-2017>

A MOOC Platform is the hardware and software needed to publish and run a MOOC [15]. A MOOC platform can be run by the institution itself or outsourced to external MOOC platforms like Coursera, EdX, and etc. The top five MOOC providers by registered users reported in the Class Central annual report of 2017 are presented on Fig. 3.

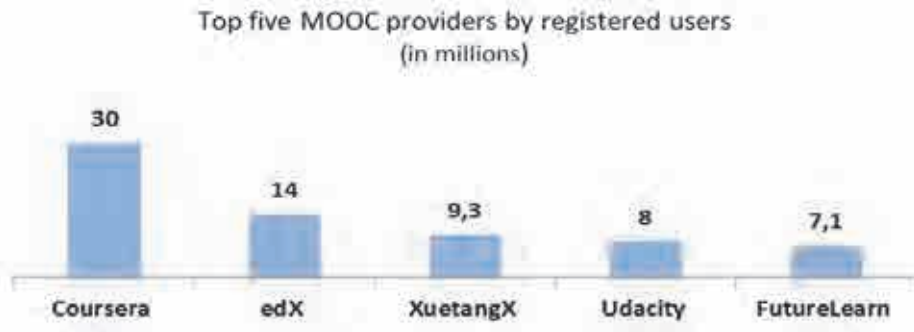


Figure 3. The top 5 MOOC providers by registered users: <https://www.class-central.com/report/mooc-stats-2017/>

The number of total MOOCs available for registration at any given time has also gone up due to the scheduling policy. Most courses are offered in a self-paced format or, in the case of Coursera courses, offered on a regular schedule, with new sessions starting automatically on a bi-weekly or monthly basis. In order the high level of flexibility for the users to be assured the FutureLearn apply quite different approach. They extend the enrollment period for their MOOCs. Moreover, for the paying students (who pay for certificates of for full access to the course materials) the access to the course is unlimited and they can finish it as a self-passed course. Hard deadlines for assignments and submissions are incompatible with the concept of flexible MOOC schedule. Usually the final deadlines are set to be the last date of the course. Some providers assure unlimited total number of attempts for the quizzes integrated in the course but with some limitation of the attempts' number per day.

As most MOOC users are already employed, the shorter time of these courses (4 to 6 weeks) makes them very attractive for the employed people who want to develop skills and competences required for the purpose of their professional development [16]. There are various factors for the exponentially increasing popularity of MOOCs. Some of the most important ones are the format and pedagogical base which consider MOOCs to be very suitable for teaching and learning of concepts, methods and theories, for obtaining practical skills and competences [17]. According to Norvig [18], MOOCs have had a remarkable ability to attract large numbers of learners to a vigorous online learning community. The constant availability makes MOOCs an excellent resource for all life-long learners and modern professionals striving for on-going career development and personal improvement.

One of the best things about MOOCs is that they can be customized. Organizations can alter or add content to MOOCs to address challenges or issues that employees may be facing on a daily basis, which will contribute for the significant improvement of on-the job performance [19].

The motivation to establish MOOCs cannot be the same in all regions of the world. The national dimension of the process should be taken into account. The concrete necessities and the specifics in terms of the socio-economic context, cost of education, and the role of the state to define the organizational strategy have to be considered [20].

### **MOOC producing - general costs and possible revenues**

The boost of MOOC initiatives is connected with several crucial issues – the issue of awarding credits, infrastructure and the business model, and last but not least the issue of appropriate adaptation to the local cultural context, specific educational needs, gaps and necessities [21,22] (Monova-Zheleva, M., 2016b). Production and development for MOOCs vary a lot between courses. The amount of money invested is typically dependent on factors such as: staff cost; length of the MOOC (e.g. 4 or 10 weeks); hours of video material produced; the production of further cost-intensive resources, such as graphs, animations, overlays etc.; post production services; existing knowledge and experience of the team; existing equipment; content availability prior to course production, etc. The development cost for MOOCs (taking all cost into consideration) are thus difficult to indicate, numbers vary between \$38,000 and \$325,000 for each course [23]. Without taking staff and initial investment (studio etc.) cost into consideration, these numbers might be lower at times. In addition, about \$10,000 - \$50,000 are needed as operational cost for teachers, assistants and mentors, every time the course is running on a MOOC platform. Video production is often one of the major cost drivers. The report estimates high quality video production cost of \$4,300 per hour of finished video. Additional costs are needed for the MOOC platform, a fee (annual or per MOOC) for a partnership with a MOOC provider, marketing, etc. [24]

One could argue that the MOOCs themselves should generate additional revenue streams that compensate for the development and operational costs. As such, all additional services that can be derived from the free MOOC offerings can be: formal certificates; Statement of Participation; individual coaching/tutoring during the MOOC; tailored courses for employees as part of professional development training (e.g., Small Private Online Course (SPOC) based on a MOOC); tailored (paid for) follow-up resources based on participants' data in MOOC; remedial courses; training people who need specific qualifications and so on. These services can be either executed by the content provider, the distribution party (platform) or both together. The fact that MOOCs require big investment but in the same time do not guarantee immediate returns is certainly another reason for caution.

What are the possible revenues and benefits for an institution to produce a MOOC? The institutions may invest in MOOCs because other benefits on institutional level justify the cost of MOOCs. As such the MOOC operation is connected to the business model on an institutional level. Possible reasons and drivers behind it might be: MOOC as a marketing model; MOOC to attract better and/or more trainees; to attract new kinds of trainees; innovation on educational provision; develop educational services that are scalable; to improve the quality of education; to reduce the cost of the regular course provision; considering MOOCs as research area. According to many US and European studies indicate that using MOOCs as innovation area (e.g. improve quality of face-to-face education offering, contribute to the transition to more flexible and online education, improve teaching) and responding to the demands of learners and societies are important objectives as well. Consequently, the possible revenue streams are related to these objectives as well.

The big MOOC platforms are usually either publicly funded or financed by the establishing of the business with equity capital and/or venture capital (e.g. Coursera). Private (e.g. companies) or public investors (e.g. foundations) supported the various providers through substantial investments (partially in the double-digit million euro range) in that stage. The MOOC providers achieve turnover via additional business-to-consumer

(B2C) services such as: issuing certifications; issuing paid Statement of Participations; donations; „Specializations” Course Curricula, and purchase courses for assignments with free audit. MOOC platforms and other providers achieve turnover via business-to-business (B2B) services such as: course production services; MOOC platform fee for hosting content; global marketing and branding; learning analytics tools; translation services; recruiting services (using anonymous data) for companies and other organizations; further services for the professional development process of an organization (customer relationship management, webinars, course moderation) etc.; training and consulting on how to design/develop MOOCs and so on.

Universities typically bundle a range of services that include teaching, assessment, accreditation and student facilities as a package to all learners, whether they require them or not. MOOCs are opening up a discussion around the unbundling of such services. Unbundling means that parts of the process of education are not provided by one, but several providers, or that some parts are outsourced to specialized institutions responsible for provision of expertise during the course content development. Despite the fact that MOOCs are offering a complete course free of charge by definition, there are monetary costs and benefits associated with it. Several stakeholders are associated with the creation and the distribution of MOOCs as well as research and further services beyond the course itself. The diversity of MOOCs and players behind it makes it thus difficult a universal business model for MOOCs to be analyzed. Overall it can be said, that the establishment of successful and financially sustainable business models with MOOCs has to be developed yet and in this context it is another big challenge for organisations to be actively involved in MOOCs initiatives.

### **How Higher Education Institutions to make better use of the MOOCs potential – survey results**

With the aim of analyzing the opportunities and potential of MOOCs for the HEIs the BizMOOC consortium carried out research involving 50 HEIs from across Europe (<http://bizmooc.eu/mooc-manual/needs-and-gaps-to-moocs/report-heis/>), establishing the base for the production of a so called „MOOC BOOK” (<http://bizmooc.eu/mooc-manual/>) including guide-lines for how to potentially benefit from MOOCs. Some of the main findings of the HEIs focused research are presented below. The BizMOOC project has considered the potential core role of HEIs in the MOOC area and conducted a study into HEI’s perspectives of their role in MOOC production and use. The BizMOOC consortium interviewed HEIs with low or no MOOC experience (as part of this study) aiming to identify reasons why some of the universities are not engaging with MOOC production, design or use. Representatives from 23 European countries were interviewed: 60% of these were based in Eastern Europe and 40% in Western Europe. The used method is based on qualitative, semi-structured interview consisting guideline with 22 open questions. The data were collected during the face-to face meetings with the interviewees as well as through telephone, e-mail, skype, and etc.

Concerning the familiarity with MOOCs the collected data show that nearly 90% of the participants were already familiar with MOOCs. A total of 96.67% of the HEIs located in Eastern European countries and Cyprus are familiar with the concept of MOOCs. Western European HEIs show a similar trend. However, even in instances where HEIs are familiar with the concept of MOOCs, only 20% of these offer any online learning (similar to MOOCs). Around 70 per cent of interviewees in both East and Western Europe reported that they were not offering or producing any type of online learning of this type as is shown on the next table (Table1).

	Familiarity with MOOCs			
	NO	YES	YES	
			Offering/ producing MOOCs	Not offering /producing MOOCs
Western Europe	4	16	2	14
% over Western Europe	20.00%	80.00%	10.00%	70.00%
% over total subsample	80.00%	35.56%	20.00%	40.00%
Eastern Europe	1	29	8	21
% over Eastern Europe	3.33%	96.67%	26.67%	70.00%
% over total subsample	20.00%	64.44%	80.00%	60.00%
TOTAL subsample	5	45	10	35
% over total HEIs interviewed	10.00%	90.00%	20.00%	70.00%

Table 1. Familiarity with MOOCs (Source: BizMOOC based on in-depth interviews)

Another objective of the conducted research was the expectations of different types of courses (face-to-face, non-MOOC online courses and MOOCs) to be examined. MOOCs enable anyone, regardless of educational attainment, to participate. This „open” aspect of MOOCs was highly valued by those interviewed; although in that respect, it is not clear, because – although MOOC are open enrolment – they are not always open content-wise as material used is often copyrighted. The collected responses regarding the added values of MOOCs in comparison to traditional online courses are summarized on the figure below.



Figure 4. Added values of MOOCs. Source: BizMOOC based on in-depth interviews

The interviewed were also asked to outline the disadvantages they associate with MOOCs and the summarization of the collected data is presented on the next figure.

16 out of 50 HEIs interviewed considered that formal recognition of participation and/or learning was needed for online courses such as MOOCs. The authors of this report assume that the existence of online badges and other forms of MOOC recognition were not known to those interviewees. As MOOCs are not recognised by the formal accreditation system and education is not standardized across Europe, it is unclear as to how, and whether MOOC could fit with qualifications such as Bachelor or Master’s degrees or HEI diplomas.

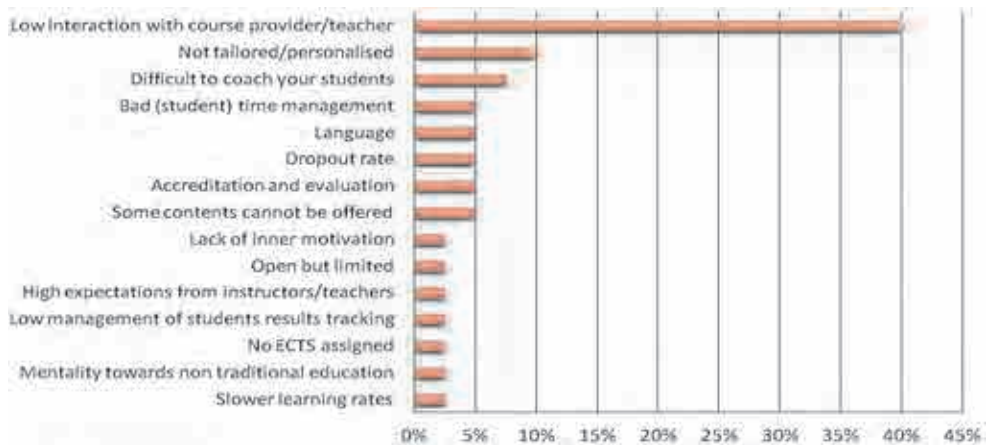


Figure 5. Potential disadvantages of and limitations related to MOOCs.

Source: BizMOOC based on in-depth interviews.

Despite the fact that a large number of HEIs around the world are offering/producing online training, numerous challenges remain. According to the interviewees, the main challenges for HEIs are the perceived high cost of producing online courses and the costs related to hosting or joining a MOOC platform. The main challenges faced are summarized in the next table.

Main challenges	
How to <b>motivate</b> participants	The <b>legal limitations</b> for course fees (traditional or online)
MOOCs or online courses are <b>not really "free"</b>	<b>Different approaches</b> of traditional and online education/training
Possible <b>mind shift</b> in both learners and instructors	The need to enhance <b>e-study content</b> and management of <b>online tutors</b>
How to identify/develop a <b>suitable, flexible production model</b>	How to provide <b>real-life and relevant examples and demonstrate</b> workable solutions
<b>Stakeholder engagement</b>	Collaboration with <b>business</b> , and the <b>changing needs</b> of the sector
<b>Maintaining partnerships, links and relationships</b>	Making sure <b>practical applicability</b> within the world of business is also reflected in the curriculum
The <b>cost of producing</b> the multimedia materials, MOOC platform and time limitation	Low levels of <b>digital literacy</b>

Table 2. Main challenges to participate in MOOC initiatives

The analysis of the received responses shows that MOOCs were perceived by the interviewee as adding value to learning and teaching. The collected responses are summarized in the next table:

Expectations	
Fill the existing gap and to provoke the market for online training to be more open and reactive	Enable learners to explore subjects not covered by the curriculum
One tool in the toolbox of an educational designer, which is appropriate for certain types of education and not others	Help learners expand and explore their interests
Minimize drop-out rates	Track learner progression so that students can login and carry on their studies where they left off
Benefit society at large and give something back (in the sense of society pays for compulsory education and the university is public-funded in the majority of participating countries)	Use as part of continuing education opportunities for employees.
Facilitate the delivery of material in a variety of ways	Increase the reputation of institutions involved
More effectively deliver across mobile platforms	A high standard of academic content
Consider the flexibility of study on a mobile device	Very short units, no longer than 1-2 hours/unit
Learn something new and interesting	Digitalisation and globalization of education.
Provide the opportunity to collaborate with specialists and expand existing networks	Remain free of charge with open access
Good quality content	Taught in local/national language
Enable anyone to acquire skills	Participation leads to certification or formal recognition of some kind
Disseminate information about specific industry news/trends	Possibility to include online courses as an elective/optional course to face-to-face offers
Promote interaction with the instructor/specialist and with other learners	Offer courses which complement the general/national curriculum
To be tailored in accordance to the (market) demand	To add additional solutions or even avoiding problems through the online learning experience
Present content in an interesting and diverse way	Encourage enrolled people and potential learners to learn, and to improve their skills and abilities

**Table 3. Expectations from online courses and MOOCs.**  
**Source: BizMOOC based on in-depth interviews.**

The possibility of creating MOOCs for business appears a very good opportunity for demonstrating and promoting university-business collaboration, although differences in working cultures and practices would need to be addressed.

Among the benefits of MOOCs for students and non-traditional, eLearning and lifelong learners were pointed out the possibility of refreshing and deepening one’s understanding of a topic via expert tuition in addition to the freedom and flexibility of self-paced learning.

The main challenge to creating MOOCs was perceived to be production costs, but that could be mitigated via HEIs collaborating with businesses and other organisations.

**Conclusions**

The appearance of disruptive innovation like MOOCs has the potential to transform corporate and vocational training as well as the higher education. In line with this necessity critical mass of good quality educational content and applications in the problems mentioned above and in multiple languages should be created. The need to develop more work-orientated training could be addressed through MOOCs in order to meet the needs of industry regarding skills, knowledge and competences. In order for the MOOCs’ potential to be best exploited the HEIs need to improve their capacity to adapt and promote this innovation. Last but not least, MOOC have the potential to contribute considerably to furthering education policies.

**References:**

1. EC-Publication. (2017). Digital Single Market, Digital Skills. Retrieved from <https://ec.europa.eu/digital-single-market/en/policies/digital-skills>
2. BizMOOC Project: <http://bizmooc.eu/>
3. EC-Publication. (2013). Opening up education through new technologies. Retrieved from [http://ec.europa.eu/education/policy/strategic-framework/education-technology\\_en](http://ec.europa.eu/education/policy/strategic-framework/education-technology_en)
4. Jansen, D.; Konings, L. (2016). European Policy response on MOOC opportunities. Retrieved from EADTU Open Education and MOOCs Publications: [https://eadtu.eu/images/publicaties/European\\_Policy\\_response\\_on\\_MOOC\\_opportunities\\_June\\_2016.pdf](https://eadtu.eu/images/publicaties/European_Policy_response_on_MOOC_opportunities_June_2016.pdf)
5. Bates, A. (2015). Teaching in a digital age: Guidelines for designing teaching and learning for a digital age. Retrieved from Teaching in a digital age: <http://opentextbc.ca/teachinginadigitalage/>
6. OECD. (2007). Giving knowledge for free - The emergence of open educational resources. Paris: OECD Publishing. doi:<http://dx.doi.org/10.1787/9789264032125-en>
7. HOME Project. Retrieved from HOME: <http://home.eadtu.eu/>
8. SCORE2020 Project. Retrieved from SCORE2020: <http://score2020.eadtu.eu/>
9. EMMA: <https://platform.europeanmoocs.eu/>
10. ECO Project. Retrieved from ECO : <http://project.ecolearning.eu/>
11. Translation for Massive Open Online CoursesTraMOOC. (n.d.). TraMOOC Project. Retrieved from TraMOOC: <http://tramooc.eu/>
12. Class Central: <https://www.class-central.com/>
13. Shah, D. (2015). By the numbers - MOOCs in 2015. Retrieved from Class Central Reports: <http://www.classcentral.com/report/moocs-2015-stats>
14. Shah, D. (2018). MOOC Course Report: <https://www.class-central.com/report/mooc-course-report-april-2018/>
15. Sfiri, A., Pietkiewicz, K., & Jansen, D. (2016). Existing MOOC initiatives in higher education and business sector and the distribution of MOOC learners in EU28. Retrieved from BizMOOC Discussion Papers: <http://bizmooc.eu/papers/initiatives/>
16. Music, A., & Vincent-Lancrin, S. (2016). Massive Open Online Courses (MOOCs): Trends and Future Perspectives. Retrieved from OECD Report: [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/CERI/CD/RD\(2016\)5&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/CERI/CD/RD(2016)5&docLanguage=En)
17. Obrist, M., & Monova-Zheleva, M. (2016). Fostering Innovation and Creativity through MOOCs. Retrieved from BizMOOC Discussion Papers: <http://bizmooc.eu/papers/innovation-moocs/>
18. Norvig, P. (2012). Helping the world to teach. Retrieved from Google Research Blog: <http://googleresearch.blogspot.com/2012/09/helpingworld-to-teach.html>
19. Pappas, c. (2015). Benefits of Using MOOCs for Corporate Training. Retrieved from E-Journal „E-learning Industry”: <https://elearningindustry.com/6-benefits-of-using-moocs-for-corporate-training>
20. Monova-Zheleva, M. (2016a). The European Initiative for Massive Open Online Courses /MOOCs/ and the Challenges for its Implementation in Bulgaria. Retrieved from E-Journal Business Research: <http://www.bposoki.bg/en/issue-2/the-european-initiative-for-massive-open-online-courses-/moocs/-and-the-challenges-for-its-implementation-in-bulgaria>

21. Monova-Zheleva, M. (2016b). Identification of regions and players lagging behind in MOOC Initiatives. Retrieved from BizMOOC Discussion Papers: <http://bizmooc.eu/papers/regions-developing/>
22. Marcin Karwiński, Agnieszka Żur, Mariya Monova-Zheleva, Yanislav Panayotov Zhelev, Francisco José Gallego Dolón (2017). BizMOOC Result 2.1: Guidelines for business, HEIs, learners (2) Guidelines for Higher Education: <http://bizmooc.eu/guidelines/heis-without-moocs/?print=pdf>
23. Hollands, F., & Tirthali, D. (2014). Resource Requirement and Costs of Developing and Delivering MOOCs. Retrieved from E-Journal „The International Review of Research in Open and Distributed Learning“: <http://www.irrodl.org/index.php/irrodl/article/view/1901>
24. Fischer, H., Dreisinger, S., Franken, O., Ebner, M., Kopp, M., & Kohler, T. (2014). Revenue Vs. Costs of MOOC Platforms. Discussion of Business Models for xMOOC Providers. Based on Empirical Findings and Experiences During Implementation of The Project IMOOX. Proceeding of ICERI2014 (pp. 2991-3000). Seville, Spain: ICERI.