

Expanding the Knowledge Base and Development of New Skills of Museum Specialists in Line with the Digital Era

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Abstract. The absence of adequate training is one of the main problems for museum specialists in the process of digitalization of tangible and intangible cultural heritage. The first part of the paper presents the main results of a survey related to the topic among the staff of Regional historical museum Burgas. The second half discusses the paradigm of Massive open online courses (MOOC) as one innovative and flexible solution for continuing vocational education and training. Presented are the results of a large scale research conducted in the framework of BizMOOC project regarding the usage of MOOCs for corporate training in European organizations including cultural institutions such as museums, libraries, archives etc.

Keywords: Vocational Education, Corporate Training, Digitalization, Museum Specialists, MOOC, Digital Skills.

1 Introduction

The rapid introduction of digital technology into museum activities in the 21st century requires the staff to have the necessary knowledge, skills and competences to effectively use the modern approaches and tools in their regular work. At present, in Bulgaria, the digitization of cultural heritage (museum funds - objects, scientific and intangible heritage collections) is at an early stage. One of the main problems is the need for adequate training of museum specialists for developing, managing and maintaining multimedia digital libraries. It is necessary to quickly build up the necessary competences in an accessible way, allowing the training to take place without absence of the specialists from workplace and possibly with minimal investment. The development of technologies and e-learning methods already provides a possible solution to the described problem.

Massive open online courses (MOOC) 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, 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 needs and problems of museum workers in Bulgaria and in particular Regional Historical Museum Burgas (RHM Burgas). The MOOC's potential for vocational education and training to raise the quality of vocational skills of museum workers, is presented.

2 Needs of Adequate Qualification and Other Issues

The Digital era has set new standards in our everyday y 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. In the last years the European Commission is promoting various initiatives aimed at increasing training in digital skills for the workforce and for consumers; modernizing education across the EU; harnessing digital technologies for learning and for the recognition and validation of skills; and anticipating and analyzing skills needs (EC Publication, 2017a).

The area of culture, creative sectors and media is chosen as priority in this task, uniting them under the European Commissioner for Digital Economy and Society. However the Digital Economy and Society Index (DESI) from 2016 shows that 44% of Europeans still do not have basic digital skills (EC Publication, 2017b).

2.1 Museum and Digital Skills

The museums are part of the culture sector and feel the strong push towards the use of new technologies in their activities. Already more than a decade continues the process of digitalization of the museum collection in Bulgaria. The process is extremely slow due to 3 main problems in the museum institution in Bulgaria:

- lack of funding for appropriate hardware and software;
- lack of regulation and set of national standards for digitalization of cultural heritage;
- the level of digital skills of the museum specialists.

The museum workers are specialists in areas, which require high-levels of knowledge but most often they are not directly connected to the IT sector. However, creating, filling and managing the digital libraries with the digitalized information, requires extended knowledge on informational technologies and specific digital skills. Developing them takes time and resources of a different nature for the workers and institution. As stated above, one of the key points is to quickly build up the necessary competences in an accessible way, allowing the training to take place without absence of the specialists from the workplace and in a timeframe that can be determined by the person alone and at a self-defined pace. Collective face-to-face courses requiring the presence of the workers in a certain location, waste valuable time and other resources as well as HR for

the museum institution that has limited staff. Often the highly educated museum specialists are uncomfortable to admit their problems and difficulties related to the digital domain, which lowers the success rate of the courses outcome. Another problem is the cost for the institution. The museums not only in Bulgaria are cultural organizations with small budgets and are looking for minimal investments.

2.2 Key Points for Best Practice

In the process of collaboration with different types of organizations – educational and scientific institutions (universities, colleges, and academies), NGOs and private companies, the Burgas museum has concluded that the key points to choose the best way of extending the digital skills of the workers are:

- Free choice of time to learn;
- Lower costs;
- Specifics in the lessons that connects directly to the field of work;
- Understandable language (developed in the native language and explained through easy to process examples).

The last two key points connect closely to the sustainability of adopted new knowledge and its best use in practice. The field of museum work as well as any other sector that has high educated specialists will benefit only from training courses that are tailored for their needs. The lessons have to connect directly to the field of work and address the issues in a way that motivates the worker to learn more. As the beneficiaries of the developed new skills are not only the workers but also the institution – employer, it is important to note its role in the process. The institution has to recognize the efforts of the workers and analyze the results. It is possible to offer certificates to the workers that successfully undergo the courses or recognize their new qualification with official statement or stimulate them with awards/bonuses. The paperwork for enrolling in the course should be reduced to the very minimum, which will allow more employees to participate in the training.

The course content should be easily accessible through computer networks and mobile devices at the same high quality simultaneously. The courses should provide world-class and up-to-date knowledge in the subject area in a variety of formats and representations. With the vast change of the digital technologies it is crucial the content to be updated, adapted and refreshed on regular basis.

The understandable language is another requirement that can improve the quality of the training. When the courses are developed in the native language and explained through real case studies and best practice examples, the motivation of the recipients is increased and their ability to learn quickly is improved.

As a conclusion to this chapter is that, key problems in the development of new digital skills in the sector are various but not unconquerable. The solution lies in the e-learning process and continuing vocational training.

3 Massive Open Online Courses (MOOCs) as a Modern Solution for Corporate Training

The European Commission launched the Opening up Education initiative in September 2013. "Opening up Education" proposes actions towards innovative teaching and learning for all through new Technologies and Open Educational Resources (OERs) to deliver education of higher quality and efficacy and thus contributing to the Europe 2020 goals of boosting EU competitiveness and growth through better skilled workforce" (EU Publication, 2013).

Rapid digital change in our society and economy means more demand for digital skills and competences 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 (EC Publication, 2013). Alongside e-learning and open educational resources, massive open online courses (MOOCs) recently emerged in the educational landscape providing additional learning opportunities for individuals, education institutions and teachers (Music and Vincent-Lancrin, 2016). Massive Open Online Courses (MOOCs) have gained a lot of attention in recent years.

MOOC stands for Massive Open Online Courses. 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 (Jansen, 2016).

Bates (2015) 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 number of participants 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” (OECD, 2007). MOOCs cover huge variety of topics (Fig. 1) and the number of the courses increases significantly in the last years (Fig. 2).

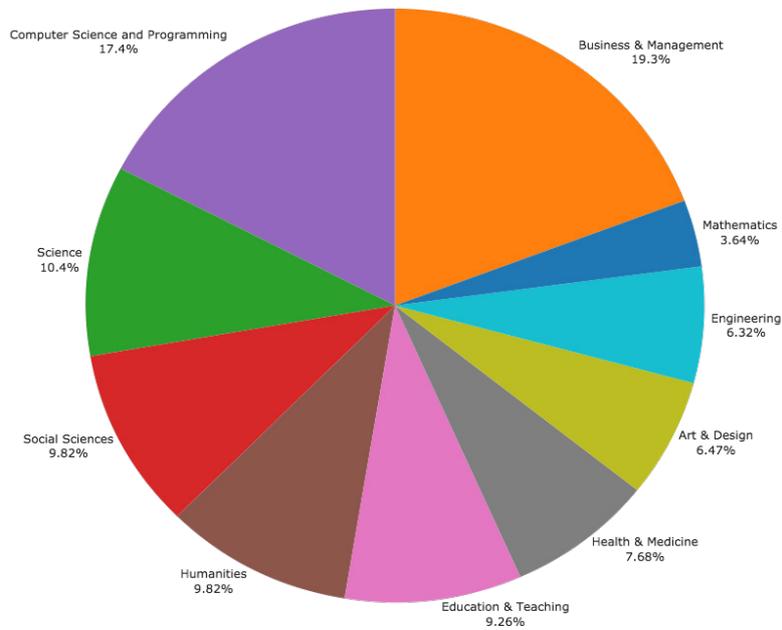


Fig. 1. Distribution of MOOCs by subject areas. Source: ClassCentral <https://www.class-central.com/report/mooc-stats-2016/>

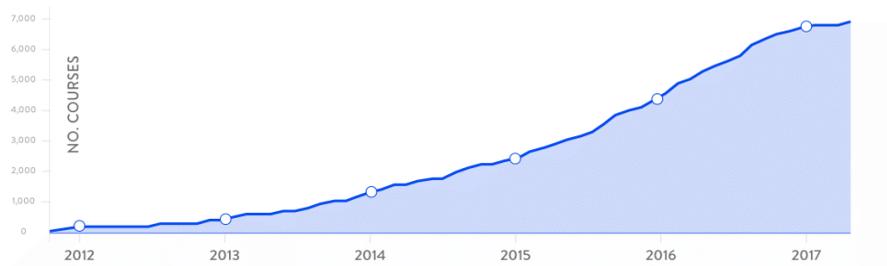


Fig. 2. Growth of MOOCs. Source Class Central: <https://www.class-central.com/report/mooc-stats-2016/>

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 (Shah, 2015). According to the ClassCentral statistics, by the end of 2016, around 58 million students had signed up for at least one MOOC (Class Central, 2016).

A MOOC Platform is the hardware and software needed to publish and run a MOOC (Sfiri, Pietkiewicz, Jansen, 2016). A MOOC platform can be run by the institution itself or outsourced to the MOOC platforms like EdX, Coursera, Udacity, Futurelearn, and etc.

ClassCentral reports in the annual report of 2015 that Coursera, edX, and Udacity are normally known as the big three MOOC platforms (Fig. 3).

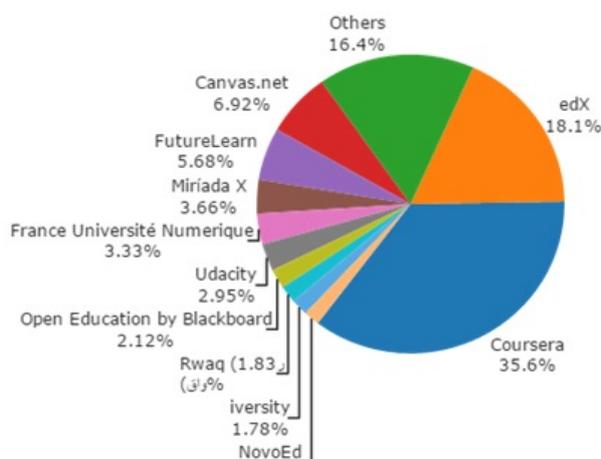


Fig. 3. ClassCentral, course distribution by providers: <https://www.class-central.com/report/moocs-2015-stats/>, accessed on 25.02.2016.

As most MOOC users are already employed, some promising trends with a successful business model could be observed in MOOCs for the purpose of professional development (Music and Vincent-Lancrin, 2016).

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 (Obrist and Monova-Zheleva, 2016). According to Norvig (2012), 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. In the context of the museum specialists, MOOCs seems to be a highly appropriate solution providing opportunity for obtaining up-to-date knowledge, practical skills, mastery, and competences for digital presentation and preservation of tangible and intangible historical and cultural heritage. 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 (Pappas, 2016).

The motivation to establish MOOCs in Bulgaria, no matter if they are addressed to the museum specialists or to other audiences and domains, cannot be the same as in the

other EU countries, United States or in the other 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 organisational strategy have to be considered (Monova-Zheleva, 2016a).

3.1 General Cost to Produce a MOOC and Possible Revenues

The boost of MOOC initiatives in Europe 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 (Monova-Zheleva, 2016b), which are also observed among the RHM Burgas specialists.

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 12 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 \$40,000 – \$325,000 for each course. 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. A 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. (Fischer et. al., 2014; Hollands, Tirthali, 2014)

However, these estimates are based on research of mainly U.S. institutions offering their MOOCs to one of the main U.S. MOOC platforms. Experiments with different kinds of MOOCs and in other continents show that these costs can be reduced by: involving target audience in either development (museum staff to be involved in the content selection, describing and production) and/or operation of the MOOC (peer-to-peer assessment, peer-to-peer tutoring, etc.); providing MOOC on own institutional platform and not outsource it to one of the MOOC platforms; using open source software for MOOC platforms or use freely available (social media) tools of the internet in network MOOCs; cost efficient video recording tools; use of exiting material and OER or even re-use complete MOOCs from other institutions; low cost partnership for those services that are scalable and best organized cross-institutional. But essentially MOOCs offer a complete course experience to learners for free. Since direct revenues from MOOC courses are often lower than the cost to produce and host the courses, the costs are not (directly) paid by MOOC participants but by other parties.

One could argue that the MOOCs themselves should generate additional revenue streams that compensate for the development and operational costs. As such, all addi-

tional 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, particularly in times of economic and financial crisis. It is not possible to expect a big progress in MOOCs if an additional funding are not available and appropriate adjustments of the regulatory frameworks that support the activities of cultural institutions and their institutional partners are not ensured.

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. These investments are mainly used for the establishment of technical infrastructure, business cooperation and market position. 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. Apart from generating revenue on a B2C level, 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 such as museums or other cultural institutions responsible for provision of expertise during the course content development (case studies, examples, best practices, etc.). 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 Bulgarian organizations to be actively involved in MOOCs initiatives.

3.2 How the Organizations to Potentially Benefit from MOOCs

With the aim of analyzing the opportunities and potential of MOOCs for the business world, the European Commission funded the BizMOOC project. For achieving its goals, the BizMOOC consortium carried out 56 interviews with organizations from across Europe in the first stage of the project, establishing the base for the production of a so called “MOOC BOOK” (<http://bizmooc.eu/mooc-manual/>) including guidelines for businesses how to potentially benefit from MOOCs. Some of the main findings of this research are presented below.

The level of familiarity of the interviewees with the MOOC concept is rather low (Table 1). It is worth mentioning that out of the organizations interviewed, only 14.28 per cent of those who were familiar with MOOCs prior to the interview, actually offer/produce MOOCs themselves. Almost three quarters of the organizations interviewed were already involved in online professional development, especially in Western European countries, but a very low percentage of the interviewed organizations are involved in MOOC related activity.

Table 1. Familiarity to MOOCs of the interviewees. Source: BizMOOC <http://bizmooc.eu/mooc-manual/needs-and-gaps-to-moocs/report-businesses/>

Aspect	Familiar with MOOCs		
	YES	NO	Offer/produce MOOCs
Western European countries	20	14	7
% Western European countries of total subsample	62.50%	58.33%	87.50%
Eastern European countries	12	10	1
% Eastern European countries of total subsample	37.50%	41.67%	12.50%
TOTAL subsample	32	24	8
% over total interviewed	57.14%	42.86%	14.28%

Despite being facilitated online, MOOCs were perceived by organizations to be a good way of increasing learning opportunities to individuals, mainly because many MOOC are facilitated.

The main benefits of MOOCs underlined by interviewees were in relation to their application within Human Resource Development and as a customer training, marketing and recruitment tool. For organizations which are already applying eLearning, MOOCs could become a core component of Human Resource Development (HRD) online training, for example, or at least complement existing resources and materials. MOOCs were perceived by interviewees as having the potential to transform current learning environments in companies. Over 70 per cent of the sample is involved in various capacities in online professional development, but with a rather low level of MOOC usage (only 17.86 per cent). The use of MOOC is largely confined to staff training (Fig. 4).

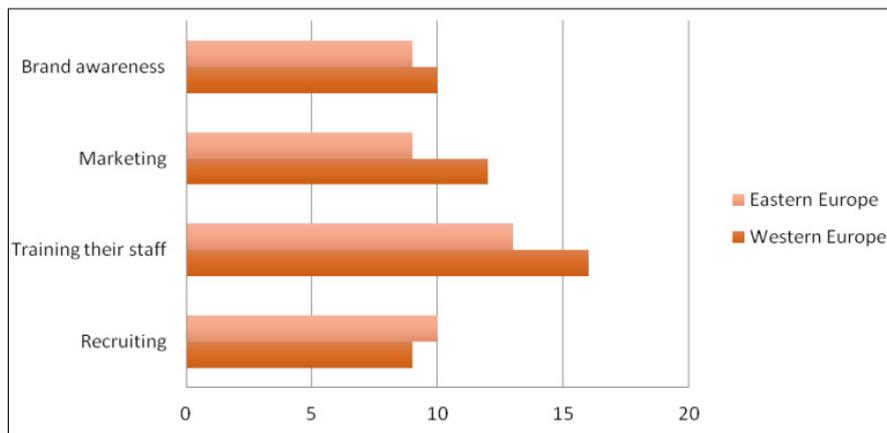


Fig. 4. Use of MOOCs by activity type and region. Source: BizMOOC <http://biz-mooc.eu/mooc-manual/needs-and-gaps-to-moocs/report-businesses/>

MOOCs are expected to have a more practical focus in order to serve daily business activities and tasks. Furthermore, they are expected to provide updated and practical knowledge/information, in conjunction with expert guidance of the field covered.

MOOCs are perceived as contributing to learner network growth and facilitating access to up-to-date and high quality information, which could make the difference when learners are looking for a new/better job opportunity. MOOCs are not just a way of reducing employer's training costs, but they could also be a complementary tool for higher education, vocational education and lifelong learning as well as a complementary education tool that might facilitate continuous professional development of the employees.

There is no doubt that representatives of the organizations interviewed would highly recommend the use of MOOCs to their staff (over 69 %) with a clear preference for this approach in Western Europe (70.59 % in comparison to 40.58 % of respondents in

Eastern Europe) – Fig. 5. MOOC are perceived as enabling access to highly sophisticated content at a low cost or even free-of-cost at the point of use.

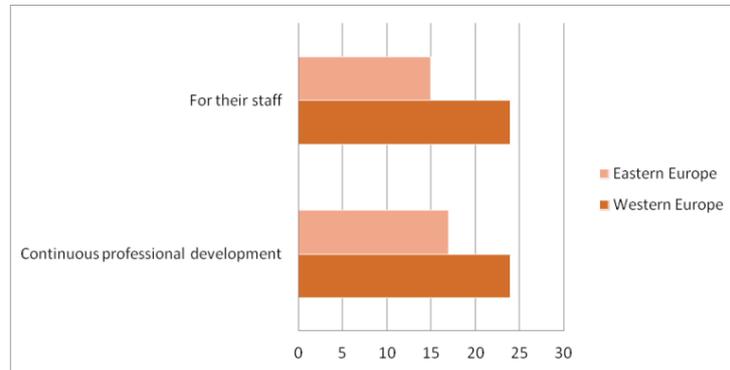


Fig. 5. Recommendations for MOOC use. Source BizMOOC <http://bizmooc.eu/mooc-manual/needs-and-gaps-to-moocs/report-businesses/>

A large number of organizations surveyed are considering MOOCs as a new and free way of training their employees. Interviewees highlighted the potential for collaboration between higher education institutions and business in relation to MOOC focused on a range of topics including soft skills and technical expertise, enriching knowledge in specific areas and updating, sharing knowledge on specific areas.

MOOCs are considered by the interviewees to be suitable for large organizations, public organizations, secondary schools, higher education etc., but their perceived needs will vary.

Different reasons for being involved (or not) in the production or offering of MOOCs can be seen in Table 2. Around 29 % of the organizations interviewed emphasized the time saving possibilities, creating networks and lowering costs. Among the reasons of not being involved in offering/producing MOOCs, legal limitations, low awareness, lack of experience and the lack of capacity to offer this type of course were noted by interviewees.

Table 2. Reasons for organizations (not) being involved in offering/producing MOOCs.

Source: <http://bizmooc.eu/mooc-manual/needs-and-gaps-to-moocs/report-businesses/>

Pros	Cons
Improvement of corporate and individual skills	Low awareness
Better than other types of training & education	Lack of experience
Cheaper training & education	Not a priority for now
High quality and responsive learning environments	Lack of capacity to offer/produce MOOCs
Solution for companies with employees all over the world	Accredited certification required
Have the expertise for developing MOOCs contents	Intellectual Property Rights
The ability to rapidly build learner competencies	Legal limitations /legal differences
Network creation/extension	Risk of revealing confidential information
Time saving in improving skills and competences	Not covering the requirements of the companies
	Social media, videos, interactive contents etc. blocked by the companies' firewalls or code of conduct

It was important to ascertain from the interview participants which skills they thought were vital to the interests of their organizations over the coming years.

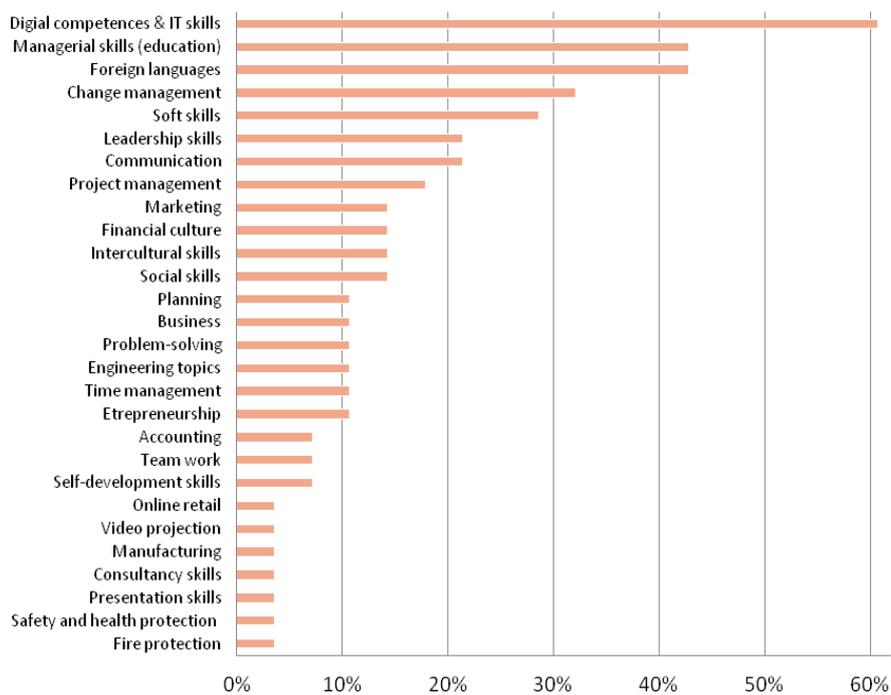


Fig. 6. Key skills considered by the organizations interviewed. Source: BizMOOC <http://bizmooc.eu/mooc-manual/needs-and-gaps-to-moocs/report-businesses/>

Among the most relevant competences and skills noted by interviewees, digital competences, managerial education, change and project management were perceived as particularly pertinent (Fig. 6).

As it shown on Fig. 7, a blended training methodology is used most frequently by the organizations participating in the survey. In comparison to MOOCs, Moodle and Youtube videos are used by relatively few organizations.

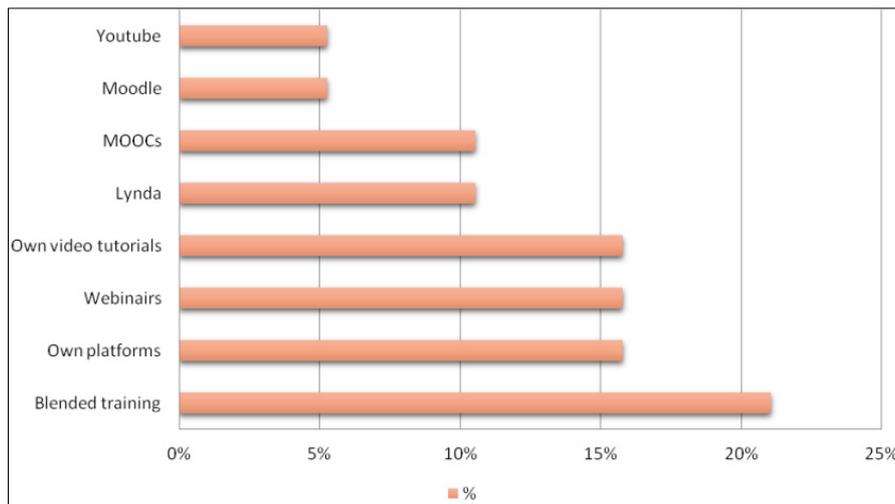


Fig. 7. Tools used for online training. Source: BizMOOC <http://bizmooc.eu/mooc-manual/needs-and-gaps-to-moocs/report-businesses/>

Regarding the potential collaboration between HEIs and cultural organizations such as museums, galleries, libraries, archives, IT companies, and etc., a number of topics were highlighted covering both soft and technical skills. However, to enable potential collaboration between these sectors, work would need to be done.

MOOCs were viewed as particularly useful for HRD, customer training or as a marketing and recruitment tool. Some of these tools would need to be created by the organizations themselves whilst others could utilize existing MOOCs. The creation of MOOCs depends on available resources, existing training structures and a willingness to examine the possibility that MOOCs could offer the organization.

Interviewees highlighted the role of policy (both at a local and national level) to increase engagement with and in the production of MOOCs. It has to be underlined that the question about ensuring the national authorities' support for digital innovation is a question of highest importance. In the context of the European Communication on Opening up Education development of a national regulation adequately responding to MOOCs is necessary.

4 Conclusions

The appearance of disruptive innovation like MOOCs has the potential to transform corporate training as well as the higher and vocational education paradigms. Thanks to their versatility and high quality content, MOOCs can offer museums' specialists the skill development and compliance training they need in order to be up-to-date with the current trends and requirements regarding the digitalization and digital presentation and preservation of the tangible and intangible cultural and historical heritage. In order for the MOOCs' potential to be best exploited the cultural organizations (and the museums particularly) need to improve their capacity to adapt and promote this innovation. In line with this necessity critical mass of good quality educational content and applications in the problems mentioned above and in multiple EU languages should be created, also connected devices for all users (trainees and trainers) should be provided.

Based on the BizMOOC conducted survey results as well as on the detected needs and key problems in the area of cultural institutions recognizes the MOOCs as a possible solution. It is doubtful they are able to offer cost effective, high quality, and flexible easy available solutions for sustainable improvement of the personal and professional skills and competences of the museum specialists in the area of the digital presentation and preservation of cultural and historical heritage.

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