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Massive Open Online Courses for Business Learning: Key research, best practices and pathways to innovation

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MASSIVE OPEN ONLINE COURSES FOR BUSINESS LEARNING

Key research, best practices and pathways to innovation

BIZMOOC



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INTRODUCTION

According to a recent study by Class Central, already more than 81 million people enrolled for Massive Open Online Courses (MOOC) in 2017. More than 50% came with career-oriented motives, for example upgrading their skills for their current or a new job. On top, more and more businesses are teaming up with universities and spin-offs (such as MOOC providers) to complement their HR programmes with MOOCs. Thus, we see a movement from traditional university settings to a professional lifelong learning context. At the same time, only a selected part of society (more educated learners with digital skills), universities (certain regions and those with stronger resources) and businesses (esp. the IT sector) seem to be aware of / profit from this free offer.

The BizMOOC project set out to further analyze this gap and provide a research-based guidance for those which are not part of the movement yet. This three-year endeavour resulted in an online resource called the MOOC BOOK (<http://mooc-book.eu>). The open textbook at hand is a selected presentation of content of the online version in a textbook format – it is designed to support learners, businesses and universities in their explorations of the world of MOOC.

We hope it gives you a head start in your 21st learning journey. Enjoy reading and learning!

Christian Friedl (Project Lead)

Rob Farrow (Volume Editor)

ABOUT BIZMOOC



“ MOOCs
for the world
of business

The BizMOOC project represents one of the largest attempts to research and understand the phenomena of MOOC across the European area. In 2016, the BizMOOC project set out to explore the applicability of MOOCs for the world of business. To identify potential, barriers and key questions related to MOOCs in the business context, a first research phase was conducted summarizing the outcomes of a survey with 1,193 learners, interviews with 106 business and higher education experts and self-produced [14 discussion papers](#) on MOOC hot topics. The developed guidelines and findings have been translated into the MOOC BOOK – an online resource for a broader uptake of MOOCs for labour-market relevant use by institutions and individuals.

The consortium consisted of 11 full partners and 3 associate partners out of 11 countries deriving from HEIs & Industry (large companies & SMEs), NGOs, networks, cluster.

- FH JOANNEUM Graz (AT)
- The Open University (UK)
- University de Alicante (ES)
- Burgas Free University (BG)
- University of Economics Krakow (PL)
- AVL List GmbH (AT)
- iversity GmbH (DE)
- DIDA srl (IT)
- Košice IT Valley (SK)
- EADTU (NL)
- The National Unions of Students in Europe (BE)

This European-wide Knowledge Alliance was carried out between 2016 and 2018. The project tackled the European challenge of enabling businesses, labour force and universities to increase their activities and exploitation of the MOOC potential. It focused on workforce & HEI training and the acquisition of labour market key competences through applying new methodologies for online

teaching & learning. This was achieved by creating common standards & frameworks on MOOCs by integrating the experiences from Higher Education and the business world.

Jointly we established a common body of knowledge on MOOCs, identified needs, gaps & reasons for businesses, labour force and HEIs to boost their MOOC activities which resulted in guidelines, recommendations & good practice. These were published in an interactive, open access resource (the MOOC BOOK) which was updated throughout the project up to the end of 2018.

The MOOC BOOK was developed under the umbrella of the EU-funded project “BizMOOC – Knowledge Alliance to enable a European-wide exploitation of the potential of MOOCs for the world of business”(Erasmus+ / Key Action 2 / Knowledge Alliance; 562286-EPP-1-2015-1-AT-EPPKA2-KA).

Based on these findings, three pilot MOOCs focusing on lifelong learning and business key competences “Learning to learn (through MOOCs)”; “Entrepreneurship & intrapreneurship” and “Innovation, creativity & problem-solving” were developed to test different approaches to career-orientated learning. You can find links to these courses later in this book.

The findings of the project were published in October 2018 and have been incorporated into the most recent version of the MOOC BOOK. The present volume is based on material from the MOOC BOOK, edited into a more accessible form. If you ever want more detail on anything in this book, then check out the relevant section of the MOOC BOOK at <http://mooc-book.eu>.

We hope that you find this book useful! Please use and share it freely with anyone.



Find out more about the BizMOOC project at: <http://bizmooc.eu>



The European Commission support for the production of this publication does not constitute an endorsement of the contents which reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

WHO IS THIS BOOK FOR?

This book is for anyone! You are free to make use of it in any way you see fit (although you must provide attribution to us for any re-use in published materials as per the CC-BY licence).

That said, there are three key audiences that we had in mind when we wrote this material.

1. **Learners** – understood very broadly to include all those interested in personal and professional development as well as those in formal education
2. **Businesses** – those who have an interest in delivering learning/training to their staff in the workplace (again, understood broadly and across private, public and voluntary sectors)
3. **Higher Education Institutions** – much investment in MOOC is still driven by HEIs and this volume is intended to support them in developing a better understanding of the potential role of MOOC in the workplace

(There is often overlap between these groups. For instance, almost everyone falls into the category of ‘learners’, and there’s no reason why one cannot be, for instance, both a learner and a business owner.)

We did a lot of research with these three groups as part of *BizMOOC* to better understand their needs and perspectives. You can read about this research at <http://mooc-book.eu/index/key-questions/>. 1,193 learners and 106 business and higher education representatives were surveyed/interviewed to provide a reliable picture of attitudes towards MOOC in these groups.

We believe that the information and advice we have assembled is of interest to a wide range of stakeholders. Information from these stakeholder groups was used to develop and evaluate the *BizMOOC* MOOCs, for instance.

The following use cases are anticipated, though many others are possible:

- Finding out about effective practice in MOOC teaching and learning for course design
- Knowing more about the MOOC evidence base
- Finding out MOOC platforms and how they work
- Detailed description of relevant issues such as copyright, use of external materials and licensing
- Understanding the characteristic concerns of stakeholders
- Considering options for certification/accreditation of learning in a MOOC
- Understanding the process of evaluating MOOC learning

HOW TO USE THIS BOOK

This book is a remix of the full MOOC BOOK at <http://mooc-book.eu/>.

The MOOC BOOK was written over the course of the BizMOOC project. The MOOC BOOK was conceived as an open resource for business, HEIs and learners to better exploit the potential of MOOCs in upgrading labour-market relevant skills. In this volume we provide a streamlined version of the MOOC BOOK intended as a gateway to exploring the application of MOOC of business needs.

You can read this book in the suggested order (which will bring you from theory to practice) but you can also focus directly on a particular area of interest right away. A glossary is provided at the end of the book to help you with your research.

Part 1 provides a general introduction to the MOOC phenomena and is intended for a general audience. It sets out the scene with regards to the history and theory of MOOC and provides commentary for each of the three key audiences of learners, business and HEIs. By understanding the interactions of these three groups is key to appreciating the unique potential of MOOC to enhance business operations.

Part 2 deals with the sequence of designing, implementing and evaluating a MOOC. These steps are relevant to anyone who is considering providing a MOOC but also relevant to learners who want to understand what happens “behind the curtain” in MOOC production. These pages provide a route map to successfully running and improving MOOC.

Part 3 delves more deeply into specific areas of focus that are key to getting the detail right in a MOOC. These chapters are much more practically focused and deal with solving problems that can arise. Go straight to this section if you are already comfortable with the concept of MOOC and you’re looking for help with a specific issue.

There is always more detail on a particular section available through the MOOC BOOK. In the Acknowledgements section you can find details of where to find the content that each chapter is based upon. The original materials contain more detail, especially in the context of European legislation and educational trends.

Finally, we provide a comprehensive bibliography of research, reports and other literature relevant to the world of MOOC. This is a great starting point for your own research and MOOC activities beyond the scope this volume.

ABOUT MOOCS

MOOC stands for Massive Open Online Courses, defined by Brouns et al. (2014) as “*an online course designed for large number of participants that can be accessed by anyone anywhere, as long as they have an internet connection, is open to everyone without entry qualifications and offers a full/complete course experience online for free*”.

Massive Open Online Course (MOOCs) are offered online and (mostly) for free, providing open access to learning opportunities for all. However, contrasting definitions and interpretations of MOOCs exists. MOOCs have made headlines in higher education 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.

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 such that the efforts of all services does 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.

The discussion is about what are essential definitions of each of those characteristics. For each of the elements different opinions are available.

- Open can be narrowed down to free availability only; learning materials are not available under an open license); not all MOOC are open accessible (e.g., age limit, sanctioned countries)
- Online can be limited to all learning materials are available online during course period and some elements of a MOOC are only available offline
- Course can be narrowed down to exclude a certificate or even exclude any form of (formative) assessment.

Consequently, some online courses are not MOOC according to the more strict definition.

International Context

Selwyn, Bulfin, & Pangrazio (2015) state that “MOOCs are courses available to masses of online learners for little or no cost”. The definition proposed by Wikipedia is more extended: “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, many MOOCs provide interactive courses with user forums to support community interactions among students, professors, and teaching assistants as well as immediate feedback to quick quizzes and assignment”.

However, these definitions are not strict and can be disputed. The Commonwealth of Learning (2015) proposes a definition that already includes some specification: “A MOOC is an online course that requires no prior qualifications for entry, can be accessed by anyone who has an Internet connection, and includes large or very large numbers of learners”. However, this also creates some discussion related to prior qualifications needed for entry, but in many cases prior qualifications are necessary to understand and success in the course.

MOOCs and open education

MOOC can be seen as a form of open education offered free through online platforms. The (initial) philosophy of MOOCs is to open up quality higher education to a wider audience. However, although the concept of open education is often mentioned, it is not usually combined with a clear and solid description of what the term means. What “open” means in open education has been the subject of some debate (Open Education Handbook, 2014) and is increasingly becoming associated with the “free” element only. Note for example that the Open Education Consortium focusses its description to the free and open sharing in education.

In his book *The Battle for Open*, Weller (2014) gives an overview of the open movement, concluding that “adopting a single definition is counter-productive” and that motivations for the open approach are the most important. In the traditional historical context open education is aimed at education for people with no or limited access to the educational system. In a somewhat broader context it is recognised that primarily open education is associated with removing barriers to education (Bates, 2015). Instead of providing a definition one could adopt the following statement related to the most common referred purpose of open education: *The aim of open education is to increase access to and successful participation in education by removing barriers and offering multiple ways of learning and sharing knowledge.*

This potential of open education was strongly marked by the Cape Town Open Education Declaration (Shuttleworth/OSF, 2008). Note that the above aim of open education is not related to barriers of access only (i.e., not only aimed at the entry barriers), but at all barriers along potential learning pathways.

In the context of MOOCs, online courses must be seen as a course that is offered fully online. If it's not, then it's a blended or hybrid course. The deciding factor should not be only related to the amount of course content offered online but all other course elements as well (i.e., study guide / syllabus, educational content, facilitation of (academic) interaction, activities/tasks, tests, including feedback, assessment and exam). As such even if a single in-person, on-campus class is scheduled and required, then the course is blended. Thus, MOOC learners rarely (if ever) need to step on campus.

Differences between MOOC and other online learning

In relation to the MOOC definition it is essential to understand the differences with other educational provision. For example MOOC differ from 'regular' online courses in at least four aspects

- MOOC are designed for in theory unlimited number of participants and as such requires the scalability of the education services.
- It is accessible at no charge.
- It requires no entry qualifications
- All elements of course provision are provided fully online

Consequently different acronyms for different kind of online or blended courses are proposed:

- SPOC (Small Private Online Courses)
- ROOC (Regional Open Online Course)
- TORQUE (Tiny, Open-with-Restrictions courses focused on Quality and Effectiveness)
- DOCCs (Distributed Open Collaborative Course)
- SMOOC (Synchronous Massive Online Course)
- MOORs (Massive Open Online Research)
- OOC (Open Online Course)

Some of the above abbreviations might even not be characterised as online courses as they require attendance on campus. The above type of online courses differ from MOOCs by some essential elements, mainly they limit the number of participants. Note that these type of online course can, for part, still be open by removing some barriers to education but are not necessarily open to everyone. As such, they are still contributing to the opening of education for all by designing a course to a limited by still multiple target group.

Authenticity and MOOC

Although there are different definitions, open and online education are recognized as underlying principles behind MOOCs. What's unique about a MOOC is partly related to the embracing of both the open (for free, no-entry requirements – open to everyone) and online component of education. The scalability and massive dimension seems the main driver behind the MOOC movement. There is no precise number to define "massive" and it might even depend on characteristics like the number of people speaking the language of the MOOC offered. It's generally agreed that in MOOCs the number of participants is larger than can be taught in a 'normal' campus class room and that the design of the MOOC is scalable ('designed for in theory unlimited number of participants'). In this context the definition as agreed on by many European MOOC initiatives (Jansen et al, 2015) seems to be the most operational, also as it defines various criteria for an open and online course to be considered a MOOC.

Due to the success of MOOCs many other (often similar) abbreviations are used. Consequently, MOOCs and the term 'open' are also misused to boost sales and increase funding. Other parties with more private and commercial intentions are increasingly using these kinds of hype words to sell their products or to get additional funding for their efforts: commercial and private products are labelled as MOOCs in order to boost sales despite failing to comply with the criteria – definition of MOOCs let alone to comply with their initial goals. The term used for these practices is called 'MOOCwashing' (Bell, 2012) comparable with 'openwashing' and 'greenwashing', which is when environmentally unfriendly products are positioned as green and eco-friendly in order to boost sales (Weller, 2014). Notwithstanding these caveats about the authenticity of open approaches, it's important to retain the idea that openness is a key element that distinguishes MOOC from elearning more generally.

PART I

MASSIVE OPEN ONLINE COURSES FOR BUSINESS AND SOCIETY

MOOCS FOR A LEARNING SOCIETY

Because of their unique qualities, MOOCs have some characteristics that make them valuable for society.

- MOOCs are designed for massive participation — MOOCs are gradually regarded as a way to address the growing number of individuals seeking to gain higher education (HE). MOOCs can also be delivered to increase participation in lifelong learning and training for very large numbers of people.
- MOOCs provide a full course experience for free, increasing access to education for all kinds of (non-formal and formal) learners (as courses offered free of charge to people all over the world, thus giving them the opportunity to decide for themselves what, where and when to study)
- MOOCs may be regarded as contributing to the democratization of HE, not only locally or regionally, but globally as well. Only an Internet connection is required to have access to quality education. Moreover, access to quality education offers citizens a better standard of life and the ability to engage more productively in all areas of human endeavour.

MOOCs thus can offer universal entry to high-quality education at no cost to the participants. One could position MOOCs as just another milestone in the process of transforming HE into a more open, accessible, flexible, affordable, transparent and accountable entity. However, the early research in MOOCs suggests that they tend to be taken by people who are already well qualified (see question ‘Who is the typical MOOC student?’), with a degree or higher. Thus the democratization argument has been countered by those who suggest that MOOCs may even exacerbate the digital divide.

The following reasons for societies to invest in MOOCs are frequently mentioned:

- To promote the development of a cutting-edge education
- To stimulate and motivate the adoption of new technologies and new forms of learning
- To offer expansive, open, free, accessible and always available knowledge (continuing education) within relevant educational fields
- To combine online and campus education
- To expand access, marketing and branding, as well as the potential for developing new revenue streams

- To reap the benefits presented by collaboration in virtual learning environments, including learning peer-to-peer, increasing digital skills, amplifying networks and recycling knowledge
- To use MOOCs as an admissions tool
- To increase enrolments and applications from students who want to ‘try before they buy’ when considering university
- To these we can add more recent findings on government perspectives, which highlight the general awareness of the potential of using MOOCs for workforce development, but which also point out a lack of national strategies to promote MOOCs as a means to mitigate unemployment or for professional development (Garrido et al., 2016)

MOOCs have opened up new possibilities and new ways for learners to access education anytime, anywhere, with lower costs, allowing them to earn whilst learning. From the students’ point of view, MOOCs not only provide access to quality educational materials over the Internet but also help them learn flexibly. Moreover, they can compare materials and educational systems through MOOCs. Besides the learning itself, MOOCs provide the opportunity to connect with people who share the same interests or professional profiles.

As a result, citizens in general are able to reach out to new groups and generate new ideas, to initiate novel projects or other interpersonal engagements, for a wide variety of purposes. However, the absence of academic support for learners means that they must be prepared to learn on their own, or with peers. This can often be difficult for inexperienced learners.

Geographically, the MOOC stage is global, so it is very likely that the learning community will be international and provide an intercultural experience. When reducing this characteristic to quantitative aspects, the numbers show a global distribution with a shift towards developing countries in recent years: for example, only 43 % of Coursera participants already derived from North America in 2013 (UNESCO, 2013, pp. 5-6). The remaining 57 % were distributed around the world and derived from Asia (26 %), Europe (17 %), South America (10 %), Australia (2 %) and Africa (2 %). According to the MOOC provider ‘edX’, over 40% of their learners live in emerging economy countries (Inside Higher Ed, 2016). In 2016 China’s XuetangX, the first non-English MOOC platform entered into the Top 3 MOOC providers by registered users according to Class Central report (2017). In 2018, Miriada X offered 690 courses in Spanish and Portuguese to over 4 million users.

More generally, the Online Course Report (2016) published numbers of 35 million learners at 570 universities and 12 providers in 2015. This has increased to 9400 courses by over 800 universities to 81 million students (Class Central, 2017). Also, the learners who participated in our Biz MOOC survey derived from 62 countries from all around the world. While MOOCs seem to offer the potential to make high-quality education available for everyone, in reality, access seems mainly limited to a specific category of learners. IPTS (2016) confirmed that also MOOC learners in Europe are individuals from privileged socioeconomic backgrounds. In addition to the intercultural dimension, MOOCs could provide a good opportunity to build a connection to peers (online and face-to-face; e.g. by identifying similar interests), so MOOCs can also enrich the social dimension of your learning experience. Some experiments show success of MOOC provision in addressing the people in need for education by re-engineering the generic MOOC model to allow for a broad spectrum of approaches and contexts, accounting for diverse languages, cultures, settings, pedagogies and technologies.

ATTITUDES TOWARDS MOOCS

During the BizMOOC project, surveys were conducted with a range of citizens across Europe including students, non-formal/lifelong learners, the unemployed and employees in a range of industries. 1,193 surveys were completed in 10 different languages. The survey combined qualitative and quantitative factors.

With increased global awareness of the MOOC movement over the past 5 years, we expected to see a high level of understanding of MOOCs from survey participants. However, in fact only 40% of the BizMOOC survey sample currently use MOOCs and about 55% have not used a MOOC. This can be contrasted with 84% of participants who use the Internet for developing their skills and/or to learn something new. In spite of this, 85% of the sample are planning to use MOOCs in the future. While 84% of respondents currently use the web for developing their skills and/or to learn something new, almost 40% are using MOOCs already and about 85% are planning to do so in the future. But after more than half a decade of MOOCs trending, most citizens across Europe still do not view MOOCs as mainstream provision for their learning. The reasons for this are varied: universities employ different methodologies, generational differences and a tendency toward more traditional training and personal development methods by some business communities and employers.

According to the respondents, the potential of MOOCs of improving personal development and the development of skills for a potential new job seem to be of high relevance when choosing this kind of informal education tool. The fact that MOOCs are massive (open to a large number of participants) appears to be irrelevant.

Despite the drift towards modernising training and teaching/learning methods via the use of ICT, face-to-face courses were still preferred by survey participants. Yet, learners generally preferred a blended user setting of both face-to-face and online courses for professional skills development. Only in instances of independent or non-formal learning was there a small preference for online learning. Participants identified video platforms and online courses as the preferred formats for self-directed learning content with the most used resources being: YouTube videos, specific tutorials and open training/open content, scientific blogs and academic articles, Moodle platforms with specific content, licensed materials, Google Scholar, MOOCs and Social Media content.

Although our sample valued MOOC offering low-cost or free opportunities for learning and acquiring up-to-date information on a specific subject, more than 55% have not yet used MOOCs. However, 85% of participants indicated that they were likely to use MOOCs regularly or occasionally, in future.

Regarding the main reasons for participating in MOOCs, improving skills and enhancing knowledge on a particular topic(s) were underlined – independently whether the respondents

had previous experience in using MOOCs or not. Respondents with no previous MOOC experience highlighted curiosity as one of the main reasons for participating in MOOCs.

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The first important sample observation was – particularly when referenced to existing research on the educational attainment of those who use MOOCs (Sharples et al., 2013; UNESCO, 2013; Ho et al., 2015; Online Course Report; 2016; etc.) – that employees and students between 18 and 55 years old with at least an undergraduate degree represent the majority of those surveyed.

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Among the three MOOCs to be developed and offered by the BizMOOC project ‘innovation, creativity and idea creation’ was considered of interest to 70% of survey respondents. The other two MOOCs, ‘learning to learn’ and ‘sense of initiative (entrepreneurship & intrapreneurship)’, were considered of interest by 51% and 42% of the BizMOOC sample, respectively.

You can read more a more detailed account of the survey results at <http://mooc-book.eu/index/learn-more/analysis/society-survey-on-moocs/>. We have also provided copies of the survey instruments for your own use. These can be found in [Chapter 22](#) with other resources.

MOOCS FOR THE WORLD OF BUSINESS

Although they are typically not part of the policies of companies within HRD (Human Resource Development) yet, global enterprises and SMEs have started offering MOOCs. Although relatively new, the impact is already enormous. By the end of 2015, approximately 4,200 courses were offered by 500+ universities to 35 million students. This has increased by 2016 to 6850 courses by over 700 universities to 58 million students (Class Central, 2016). Hence, 23 million new participants were registered in 2016 alone. In 2017, the numbers increased further to 81 million students, 800+ universities and about 9,400 courses (Class Central, 2017).

As with regular training offers, the quality of MOOCs strongly depends on the provider and the applied quality assurance. MOOCs started as a non-formal educational provision – and consequently are placed outside the quality control of formal courses offered by higher education systems. Some MOOCs are developed by professors individually (or in small teams), other MOOCs are co-created with companies and some universities even have whole departments support/developing MOOCs including quality control mechanisms.

Corporate Benefits of MOOC

The following is a list of the perceived corporate benefits of utilising MOOCs highlighted by interviewees within the BizMOOC project (Driha, Friedl & Jansen, 2016):

- Boost employee productivity and profits
- Improves employee retention rates
- Addresses real world challenges to improve on-the-job performance
- Organisations can identify motivated employees who possess desirable skill sets
- Increase the confidence of employees
- Ensure that employees are up-to-date with skills and professional knowledge
- Free training
- Possibility of enlarging employee and employer's networks
- A variety of levels of training can be integrated into employee development plans
- Introductory training MOOCs can cover the basics or part of the introduction/new employee processes
- MOOCs provide flexibility in time (both pace of study and when to start) and in

knowledge to acquire (not obligatory to follow all lessons of the course)

- Increased use of MOOC in the workplace require policies to support their promotion and implementation
- Support team spirit and cooperation
- Promote intercultural competences.

Before selecting a MOOC for your company, you may wish to assess and review the quality of the MOOC on offer, in order to assure that the MOOC has a high quality, and that it meets your learning needs. There are a number of ways helping you to identify and assess the quality of a MOOC:

- Look for a clear description of the course – including the breakdown of the modules available, its intended learning goals and outcomes
- Examine the materials available on the course – ensure the video is of high quality, and that there are e-books and other high quality materials available for download
- Who is the provider of the MOOC? Was it produced by a reputable university or another provider?
- Is the MOOC hosted by one of the recognised platforms? It doesn't have to be; many universities have developed MOOCs on their own platforms, but if it is on a platform such as Coursera, FutureLearn, etc.
- it indicates that the MOOC went through their agreed production process
- Are there opportunities to work in groups and with other participants – to share ideas and experience, through the use of online communication tools? Can you interact with instructors?
- Will you receive continuous feedback and tracking of progression?
- Does the MOOC offer a certificate or statement of participation?
- Check to see if the MOOC has been based on the regular courses of a formal programme
- Look for some sort of quality label or evidence of a quality assurance process
- Check for information regarding processing of data, intellectual property, copyright information

What Kinds of MOOC are Available?

Participants that complete a MOOC may get different kind of certificates depending on the MOOC provider; ranging from digital badges, certificates of participation, verified certificates, statements of accomplishment etc. More recently some MOOC providers have been providing certificates to a collection/series of MOOCs, using terms like Micromasters, nanodegrees, online course programs, etc. some of which are recognized as partial credit towards a formal qualification in higher education.

With more than 9000 courses offered (Class Central, 2017), a broad variety of topics is available,

including many HRD issues, business skills and even highly specialised courses. You can usually find information on the sites of the providers directly about the MOOCs they offer:

- MOOC List (<https://www.mooc-list.com/>) is an online directory of MOOCs, which provides information on the MOOCs offered by different providers, and provides search functionality by multiple criteria (topic, theme, provider, course length);
- Class Central (<https://www.class-central.com/>) is another online platform which collates information about online courses available;
- OpenUpEd (<http://openuped.eu/>) – a list of MOOCs from European providers that meet certain quality guidelines.

Using MOOC Data

During the participation in a MOOC a wide variety of personal and activity data of the participants is collected and used for different purposes by tutors, hosting platforms and possible third party actors, such as universities or companies. Partly, this data is processed by the Learning Analytics modules, in order to understand and optimize the learning process.

Four types of data are encountered: personal (private, sensitive and confidential) and non-personal. The term “personal data” is legally recognized and is defined as “any information relating to an identified or identifiable natural person (‘data subject’); an identifiable person is someone who can be identified, directly or indirectly, in particular by reference to an identification number or to one or more factors specific to his/her physical, physiological, mental, economic, cultural or social identity.

The implementation of data privacy and data protection in MOOCs is not an easy task because it includes the involvement of multiple stakeholders and interested parties with a wide variety of interested issues applying in different context. Additionally there is a need for the development of appropriate mechanisms and tools for good data classification, for delivering complete information to learners about their collected data and for schemes in support of suitable choices in a given learning scenario.

Since May 25th, 2018 at least the European providers have to be compliant with the [General Data Protection Regulation](#), another set of criterion to be considered when selecting a MOOC platform or course.

Integrating MOOC Provision

MOOCs can be easily integrated into already existing corporate learning programs as it is just a different training method. One advantage is that the staff training with MOOCs can also be conducted outside the working time. Hereby the question arises whether training is working time or leisure time. If the advanced training is taking place outside the working time (e.g. on weekends or during official holidays), the regulations of the law on rest periods need to be taken into consideration (Kraft, 2008). Furthermore, the order to work overtime needs to be covered by the contract of employment or the wage agreement and there must not be any opposing interest of the employee (e.g. incompatibility with childcare obligations, already booked weekend holiday, etc.)⁵.

Of course the respective country’s regulation needs to be taken into consideration. In Austria the

following regulation is applied according to the Austrian Act on Working Hours: Working time is classified as those periods of time where employees are present in the employer's range of authority and are liable to its directives. During the working time, the employee cannot determine the usage of the time on its own. Whether advanced staff training is classified as working time or not is determined by the specific agreement and the working contract of employer and employee.

According to Kraft (2008), in the case such an agreement does not exist, the determination of working time or leisure time depends on whether the participation of the training was:

- Mandatory directed by the employer → definitely working time
- Realized due to a specific request of the employee or at least not mandatory and the employee had the choice to participate or not → in this case, the advanced training needs to be classified as working time at least if the training was conducted during the regular working time.

When self-designing and/or producing MOOCs, a lot of organisational effort as well as resources are required. In this respect, considerable time and financial resources for the following factors need to be considered: the virtual platform, the design, production, teaching and evaluation of the course, the development of content and technology (Renz, Schwerer, Meinel, 2016).

Therefore, the costs for producing a MOOC range from € 25,000 to € 500,000 (Schultz, 2014). This wide range is derived from the various demands of the companies on MOOCs.

According to Schultz (2014), the expenditures for a MOOC depend on the following three factors:

1. Platform (fixed costs, variable costs of support)
2. Content (fixed cost)
3. Teaching capacity (variable costs depending on the number of participants) (Renz, Schwerer, Meinel, 2016)

According to Schultz (2014), the process of producing a MOOC is divided in four phases; each phase is assigned with a different amount of required time and costs as a percentage (Renz, Schwerer, Meinel, 2016):

1. Design phase (1-2 months/5%)
2. Production phase (2-6 months/35%)
3. Teaching phase (1-3 months/45%)
4. Evaluation phase (1-3 months/10%)

Traditional in-company e-learning systems lack support for the two characteristics that distinguish a MOOC from a mere online course. Remember that MOOCs are open and designed for (potentially) massive audience, most traditional Learning Management Systems (LMS) do not support this adequately. In addition, most company owned e-learning systems are not open to the world. Both, the massiveness and the openness are the core elements that distinguish MOOCs from traditional e-learning. However, for some organisations the number of participants is limited by language and by topic. Those organisations make a 'clone/copy' of existing e-learning platform on a dedicated server open to anyone (so no interference occur with regular pay-for, closed courses).

If MOOCs are produced by the company on their own, certain technical requirements are needed. Apart from the production requirements, a learning platform needs to be installed so that every

employee/participant can access the course. Some companies collaborate directly with certain universities or MOOC providing platforms and use their platforms to provide their MOOCs. The big advantage of self-produced MOOCs in terms of language issues is that the company may produce and determine the language and potential translations or subtitles adjusted to the company's needs.

PERSPECTIVES FROM BUSINESS

Despite being a relatively new phenomenon, Massive Open Online Courses (MOOCs) have started to be employed not just within the Higher Education system, but also within a corporate context for recruiting, the training of new employees, Human Resource Development (HRD), marketing, and even brand awareness (Grossman, 2013; Iversity, 2015; Radford et.al., 2015; Sreeleakha & Manikandan, 2015).

The evolution of information and communication technologies (hereinafter ICT) has led to fast paced developments and changes for online learning education/training (Fasihuddin, Skinner & Athauda, 2013). In today's globalized world, knowledge-based economy with dynamic progress places competitiveness as a relevant element for many countries and sectors. Both competition and information sharing are the drivers of the knowledge-based economy (Zhang, 2003).

In fact, more than 100 elements are considered as determinants of productivity, fundamental for improving competitiveness. These factors are grouped by the World Economic Forum in the Global Competitiveness Report into 12 pillars: institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, goods market efficiency, labour market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation. According to the stage of development of the economy, each one of these factors are more or less relevant.

Under the recent evolution of business and ICT, technological readiness, business sophistication and innovation are crucial for the economic development (Schwab, 2015). By technological readiness, the agility to adopt existing technologies for improving the productivity is meant, especially regarding the capacity to fully leverage ICTs in the activities and production processes. This way, efficiency is improved and innovation is enhanced. Having access to advanced products and blueprints and the ability to absorb and use them is crucial for the firms aiming to be successful.

Higher education and training are generally highly relevant, but business sophistication and innovation are playing a very important role, especially in the case of countries that already have exhausted, to a large extent, the more basic sources of productivity improvements as the first 10 pillars considered in the Global Competitiveness Report (Schwab, 2015).

Fostering Innovation

The quality of business networks is extremely relevant as opportunities for innovation in processes and products are easier to be created when companies and suppliers are taking advantage of

efficient networks. Under these circumstances, entry barriers in the market are reduced allowing this way the entrance of new firms.

Innovation is a particularly important aspect, because it is about approaching the frontiers of knowledge. Nowadays, firms aiming to maintain a competitive edge and move toward even higher value-added activities must design and develop cutting-edge products and processes. For this reason, the World Economic Forum underlines that the involvement of both public and private sectors in creating a special environment is necessary, i.e. facilitating the following three main aspects:

- The presence of high-quality scientific research institutions able to generate the basic knowledge needed to build the new technologies;
- Large collaboration in research and technological developments between universities and industry;
- and the protection of intellectual property.

Within the context of the recent economic crisis and the subsequent political agenda austerity measures were requested by the European Union and the International Monetary Fund to a large amount of countries, especially Europeans. These measures affected particularly education, research and development field due to the budgetary reduction. Therefore, education has rise in cost since 2009 onwards whilst also, unfortunately, in some cases decreased in quality (OECD, 2012, 2013b). The consequences of this context are not confined to education.

Addressing Labour Market Trends

Additionally, the labour market has shifted in many countries. Unemployment has soared, in particular youth unemployment, which was, and still is in some cases, concerning. In fact, youth unemployment seems to keep policy makers awake at night (OECD, 2013a). Solutions to unemployment are not easy to design or to implement when the economy is facing cascade drawbacks (as in the period 2009-2016) and when expectations of the society are above the possibilities due to the labour market status before the recent crisis compared to the one of today. In this sense, labour policy and its reform had a determinant impact on labour market across Europe.

This new and (potentially) unstable economic situation has led towards shifts in the education system with a renewed focus on developing curriculum to be responsive to the labour market. ICT has allowed many people to access education. MOOCs are “not the first occurrences of either a potential disruptive technology or distance learning“, and they “do not seem to be the last of either one” (Treadway, Ayala & Dicke, 2013). In fact, MOOCs could be employed for designing a strategic opportunity/solution to meet local requirements through enhancing related skills and capabilities (Patru & Balaji, 2016). It is therefore anticipated that MOOCs, by building new learning/training routes towards tertiary education and by providing lifelong learning opportunities, are well placed to provide skills training that aligns to labour market requirements. In fact, MOOCs for the world of business are already among two out of six trends for MOOCs (Shah, 2018a): The share of professional learners in MOOCs is significantly growing and we see a stronger uptake of corporate training by companies.

Another learner survey carried out by Class Central (Shah, 2017) outlines that 52% of learners are taking MOOCs to upgrade their skills for the current job and 49% to open up new career pathways.

When asked about potential benefits realized by a MOOC, more than 50% listed job-related benefits (such as improved performance at a current job, getting a new job or earn a promotion).

The Role of Policy

MOOCs have huge potential that should be exploited and facilitated by governments for accelerating and ensuring social cohesion as well as sustainable growth (Nisha & Senthil, 2015). In this sense, Patru & Balaji (2016) consider that policy makers should consider triggering:

- On one hand and given the knowledge-base economy, innovation and improvement of education through open and online education. In this sense, MOOCs could be an excellent option for promoting lifelong learning;
- On the other hand, unemployment might be also tackled by matching the needs of the labour market and the skills and aptitudes of the majority of university graduates. Also in this case, MOOCs can be (at least partially) a good solution.

Those requests are also in line with studies carried by Calonge & Shah (2016) and CEDEFOP (2015) that conclude that MOOCs constitute viable opportunities to support labour market-relevant skill development.

Stimulated by the prospect of global recognition and huge numbers of international learners, more and more higher education institutions (hereinafter HEIs) are providing MOOCs. Consequently, the number of MOOCs available is still increasing. By the end of 2015, approximately 4,200 courses were offered by 500+ universities to 35 million students. This has increased by 2016 to 6,850 courses by over 700 universities to 58 million students (Class Central, 2016) and jumped to 9,400 courses catered to 81 million students in 2017 (Class Central, 2018; note, that those numbers only include the platforms and courses listed on Class Central). The growth is to some extent related to efforts of European institutions. Jansen & Goes (2016) report that four independent surveys indicate that over 45 per cent of HEIs in Europe intend to offer MOOCs. This is in contrast to the USA where the number of HEIs that either offer a MOOC or plan to do so has remained stable at 12-13 per cent for the last three years (Allen & Seaman, 2016). This raises the question why so many European institutions are involved and how MOOCs are used for lifelong learning opportunities and the business training needed. The latter is part of the BizMOOC project and to some extent addressed in this report.

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 to apply a universal business model to MOOCs. The rapid growth in the MOOC market leads to the influx of new stakeholders, bringing in new services, sponsorships, customers, cross-financing models etc. in the whole world of MOOCs. Currently, there is also a trend towards an increasing amount of corporations using MOOCs or the format of MOOCs for professional development activities, which might not only increase the revenues and business opportunities in the market substantially, but also challenge the open education approach. Again, Class Central recently announced, that MOOCs finally become “big business” (Shah, 2018b), based on announcements by big players such as Udacity and Coursera. The question stays if this is true for all institutions or only some big players.

As well as in the case of HEIs, the reason of developing MOOCs is not the immediate achievement

of profits, but using them as a tool for various objectives. Jansen & Schuwer (2015) report that the most dominant objective is to increase institutional visibility and using MOOCs for reputation reasons. But also using MOOCs as innovation area (e.g., improve quality of on campus offering, contribute to the transition to more flexible and online education, improve teaching) and responding to the demands of learners and societies are indicated as important objectives.

Summary

Despite the fact that MOOCs are a still recent phenomenon of the past seven years, they are more and more used in the corporate context, especially in (Grossman, 2013; Iversity, 2015; Radford et.al., 2015; Sreeleakha & Manikandan, 2015):

- Recruitment processes
- Training employees on compliance areas (such as health and safety at work or fire prevention for example)
- Training employees on specific fields counting with high flexibility, scalability and openness
- Human resource development in general
- Marketing and brand awareness by collaborating with high ranked universities increasing this way the visibility and reputation of the organisations involved

Larger companies already created their own MOOCs, but almost entirely in cooperation with educational providers. Examples include Udacity teaming up with Google, Deutsche Telekom with Cadena, or SAP teaming up with the Hasso Plattner Institute (HPI). Also the major MOOC platforms established special programmes. Coursera already caters to 500+ companies with a special business programme, or EdX is working with 40 companies. In addition, some companies use external MOOCs to complement their HR offers.

Summing up, in the current knowledge-based economy characterized by industrial change, globalization, increased intensive competition, knowledge sharing and transfer, and ICT revolution, learning is one of the most indispensable activities (Zhang, 2003). Education and training worldwide is offering huge opportunities for business that might be further exploited by organisations. MOOCs are starting to take a role in this development and are increasingly employed in the world of business.

The business community experiences the economic and labour dynamics at a faster rhythm than higher education. For transferring the rapid responses to the educational offer, university-industry collaboration is recommended as it facilitates updated learning and knowledge acquisition offer (Patru & Balaji, 2016). At this point, the business community is playing a crucial role in aligning the skills of learners (being students, employees or unemployed people) to the labour market needs.

In summary, MOOC have the potential to:

- Become a way of training employees on very specific and concrete topics. This type of very focused course could utilise automated assessment;
- Educate new employees on the basics of their new role and on key aspects of the company;
- Complement employee existing experience with underlying theory and knowledge;

- Support personal educational interests, which the company cannot provide for;
- Promote interaction through online forums etc.;
- Promote corporative involvement in offering/producing MOOCs;
- Contribute to the continued modernisation of higher education;
- Adapt higher education course material and training to the workplace at low cost;
- Facilitate rapid and efficient lifelong learning.

KEY ISSUES IN MOOC RESEARCH AND PROVISION

To understand MOOCs, it is essential to understand how they differ from other educational provision. MOOCs differ from 'regular' online courses in at least three aspects:

- MOOCs are designed for (potentially) unlimited participants and as such offer the potential to scale up education at marginal cost;
- MOOCs are typically, to some extent open and accessible for free and without prior entry qualifications;
- All elements of course provision are provided fully online in a MOOC (though some have included other elements).

Per their definition as 'open', MOOCs are usually free to access and study. However, there are monetary costs associated with them and MOOC providers are constantly searching for sustainable business models. Examples include: free participation, with fee-based certification; tutoring; individual coaching; tailoring courses to specific target groups; providing follow-up resources; or other services.

Until recently most universities wouldn't consider recognising MOOCs as formal learning, but certified MOOC learning is sometimes recognised as prior learning – this will depend on the institutions involved.

The issue around identity and credit is of highest importance. Once a student completes a MOOC, the University needs to ensure that he or she has really learned something and earned the credit. One possible solution is for institutions and MOOC entities to develop working partnerships with testing centres and verification technology companies. Recently, MOOC providers have offered the possibility of acquiring formal credit for MOOC completion, and in some cases they are already accepted as part of a formal (Bachelor or Master) program. The credibility of MOOC content and completion is less contentious when the MOOC is produced by the HEI. In this case the recognition of credits can be automatic. Some universities partner with MOOC platforms instead of producing own MOOCs and still recognise the credits.

HEIs are primarily interested in MOOC for the following reasons:

1. **Financial benefit.** Production of MOOCs can affect HEI's economics by lowering costs (same course for numerous students can save teaching hours) or increasing revenues,

generating additional income (from learners outside of HEI). A proper integration of MOOCs in higher education can contribute to a more effective use of teaching time. Conversely, they can also offer a flexible learning to traditional students and lifelong learners. Reuse of MOOCs provided by other institutions contributes to cost-efficiency of the educational offer. This needs to be supported by appropriate adaptation and repurposing in line with the concrete necessities and priorities of educational goals and programs. Furthermore, it is potentially possible to translate free access MOOC students into paying students, or to reach international students (Zhenghao et al., 2015).

2. **Reputation, image and visibility.** Some MOOCs produced by HEIs are addressed to prospective students, which can affect student recruitment. MOOCs hold a significant marketing potential, extending the reach of the institution and access to education, building and maintaining the institution brand. For example MOOCs can be addressed to learners from developing countries or students with no access to education or those who cannot afford it (Dillahunt et al., 2015). Providing access to open MOOC platforms increases the visibility and positive image of HEIs. Enhanced image will also affect employer branding in the long-term.
3. **Innovation.** MOOCs produced for HEIs community can improve quality, diversity and attractiveness of on campus offering. Engaging with MOOCs can foster creativity and innovation at HEIs. The MOOC production process involves innovation in teaching and learning in terms of course content and forms of acquiring new knowledge, which can significantly contribute to improving educational outcomes for MOOC participants and on-campus students, improving overall teaching quality, and supporting the transition to more flexible and online education.
4. **Contribution to society.** HEIs engage in MOOCs for reasons relating to their core mission. MOOCs enable access to quality education to as many as people possible and contribute to continuous education of various social groups. MOOCs can be addressed to unemployed helping them to develop certain skills needed for employability. They can also contribute to the free training of employees. MOOCs can serve as great platform to enhance the knowledge circulation in the society, including disseminating new research results (Hanley, 2014).
5. **Supporting traditional delivery.** This is usually the first step for HEIs to engage in MOOCs. It takes time for faculty to adapt to the possibilities of MOOCs. It will take a significant investment in “humanware” (http://myнкуhelp.nku.edu/content/dam/StrategicPlanning/docs/OnlineEducationandInnovation/AGBreport_2013_MOOCs.pdf) to transform the way teaching is delivered— either on campus, totally online, or somewhere in between (blended). The transition to a new platform or delivery system requires support (e.g. from course designers, multimedia specialists, etc.) (Azevedo, 2012). Whether that effort is managed centrally by a senior administrative leader or distributed across the existing administration—and how it is facilitated—are matters of institutional culture.
6. **Specialization within education:** HEIs typically provide services that include teaching, assessment, accreditation and student facilities as a package to all learners, whether they require them or not. MOOCs could contribute for unbundling the process of education, which means that different parts of this process could be outsourced to specialised institutions and/or be provided in collaboration by several providers. Thus the

MOOCs from several providers could be used as a resource for traditional University courses. MOOCs are seen as an accelerator of these unbundling processes by outsourcing or splitting among partners the marketing efforts, ICT/delivery platform, exams, learning analytics services (Robertson and Komljenovic, 2016).

Production

Production and development for MOOCs vary between courses and between countries. The amount of money invested is typically dependent on factors such as:

- staff costs – number of faculty, administrative and instructional support personnel taking part in the process
- length of the MOOC (e.g. 4 or 12 weeks);
- hours of video material produced and quality of videography
- programming for special features (computer code auto-graders, simulations, gamification, virtual labs and others)
- production of further cost-intensive resources, such as graphs, animations, overlays etc.
- copyright permissions
- type of delivery platforms
- post-production services and technical support for participants

Naturally, the production of MOOCs by HEIs is highly dependent upon the existing knowledge, experience, equipment and content available prior to course production, etc.

For each presentation of a course on a MOOC platform, operational costs for teachers, assistants, facilitators and mentors are incurred. Additional costs are needed for the MOOC platform, a fee (annual or per MOOC) for a partnership with a MOOC provider, marketing, etc.

The production and launching of MOOCs is definitely an extra expense for most organisations. The costs connected with the MOOCs development and implementation can be reduced by:

- involving the target audience in either the development (young people learning to code) and/or the operation of the MOOC (peer-to-peer assessment, p2p tutoring, etc.)
- providing the MOOC on your own institutional platform and not outsourcing it to one of the MOOC platforms.
- using open source software for MOOC platforms or use freely available (social media) tools on the internet in network MOOCs
- cost efficient video recording tools
- using of existing material and OER or even re-use complete MOOCs from other institutions
- a low cost partnership for those services that are scalable and best organised cross-institutionally.

In spite of unavoidable and necessary costs, MOOCs carry several potential opportunities for increasing income. These might include:

- Raising institutional visibility
- Building a stronger brand
- Improved pedagogy (large samples of data contribute to increasing teaching and learning effectiveness)
- Increasing student enrolment
- Reaching new students in conditions of continuously changing student demographics
- New projects and partnerships due to enhanced exposure

Direct revenue streams can be generated only through additional services or products sold online as complementation or expansion of the core MOOC. Additionally, it should be considered (in terms of financing the extra expenses of MOOCs) the uneven status and resource availability in each country/region and type of HEI. In Europe, the provision of higher education is funded and partly controlled by national governments. The continental European approach to higher education is typically state-funded in which most institutions have equal resources and status while the more market-based U.S. model has mixed private-public funding and provision with large difference between HEIs.

Overall, MOOCs do not yet have a proven sustainable economic model, and this is a crucial point. MOOC production costs are high if the quality is to be competitive, and their benefits or potential returns are indirect and often long term. However, improved image and visibility, a stronger brand, higher student enrolment thanks to a positive opinion gained through MOOCs and new collaboration avenues are (indirect) long-term benefits which are absolutely key in today's global competitive educational services environment.

IMPACT ON HIGHER EDUCATION

Since the beginning of the 20th century, the world has evolved at a much faster pace and in a more complex way as a consequence of globalisation. Rapid economic growth, increasing competitiveness and innovation were influenced by evolving information and communication technologies (ICT). This impacted on all sectors, including higher education. Given that around half of the global population (3.5 billion people) are regular users of the Internet, largely due to the expansion of mobile networks and decreasing prices, online content and interaction with a global audience have experienced a remarkable consolidation (ITU, 2016). The advances of Internet use have considerably contributed in changing the living standards of many people, their communication channels and their working habits and tools (Patru & Balaji, 2016).

ICT, and in particular web based technologies, has had an increasing impact on our personal and professional lives over the last decades (Dumitrescu, 2015). MOOCs, as part of ICT, were able to become a hot topic in education through the combination of ICT, faculty presentations, subjects and the funding of initial courses (Billington & Fronmueller, 2013). An increased democratization and efficiency of instruction, as well as the transformation of teaching and learning processes are some of the consequences of using MOOCs within an educational context (Dumitrescu, 2015). Consequently, MOOCs are considered by some to be potentially the disruptive innovation of higher education (Hardesty, 2013). Even if some researchers stipulate that MOOCs are a challenge for some HEIs (Smutz, 2013) – as not every HEI can cope with the development of MOOCs, as there are no sustainable business models, quality assurance issues etc. –, others argue that MOOCs are just another ed-tech bubble that will not transform education (Crispin, 2012). However, even if the technologies and tools might change, the impact of MOOCs on higher education will last.

Global Opportunities

Frequently mentioned motives for developing MOOCs, as given by HEIs, are: boosting student recruitment; creating flexible learning opportunities (for new students); increasing institutional visibility and reputation; using MOOCs as areas of innovation (e.g., to improve the quality of on-campus offerings, contribute to the transition to more flexible and online education, improve teaching); responding to the demands of learners and societies (Jansen, Schuwer, Teixeira & Aydin, 2015). In addition, MOOCs are perceived as a tool enabling students to obtain their educational credentials more rapidly in addition to being a more flexible educational provision and a way of lowering the cost of education (Walton, Coningham & Horn, 2015). MOOCs are therefore an important global trend for both producers and students.

One of the most attractive aspects of MOOCs is their internationalism, both in terms of content and geography (learners and course facilitators can come from all over the world). MOOCs enable anyone, regardless of educational attainment, to participate. In addition, MOOCs are a good marketing tool: providing an experience for learners that may influence their decision to enrol at a particular institution.

Data from BizMOOC

16 out of 50 HEIs interviewed within BizMOOC believe formal recognition of participation and/or learning was needed for online courses such as MOOCs. Still, as MOOCs are not recognised by the formal accreditation system and education is not standardised across Europe, it is unclear as to how, and whether MOOC could fit with qualifications such as Bachelor or Master's degrees or high school diplomas/GCSEs, etc. Most interviewees thought that some kind of separate accreditation was adequate and it should be appealing to a broad range of learners. In addition to certification, online badges (such as those developed by Mozilla) were also considered important by some interviewees. Language was considered a potential barrier to the use of MOOCs, particularly as many are English language only.

Our research shows that a rather low number of the BizMOOC sample is familiar with MOOCs, but more than 94 per cent agree with the definition offered, with some interviewees offering suggestions for furthering that definition. More than 71 per cent of the organisations interviewed are already involved in online professional development, especially in Western European countries. Yet less than 20 per cent of those interviewed are involved in producing or using MOOCs. There is therefore room for improvement, particularly when comparing Eastern and Western Europe.

Education is becoming more personalised: from face-to-face courses to open and online offerings, technology can facilitate the sharing and exchanging of experiences. As one indicated in the interview of one large organisation, MOOCs in general are a good way of offering learning opportunities, largely due to the "human factor". For example, fora offer students from around the world the opportunity to interact and learn together; potentially creating a learning community.

According to McPherson & Bacow (2015), there is an increased interest in blended or hybrid concepts (e.g. the use of both face-to-face and online learning in a course). This could be an advantage for enlarging the awareness of MOOCs underlining their benefits and cost efficiency. MOOCs have the potential to widen access to education, particularly in a climate of where the role of education is under question, there is an increase in unemployment and funding cuts are impacting on resources. Interviewees highlighted a number of opportunities for the use of MOOCs within a corporate context. In particular, MOOCs were viewed as particularly useful for human resource development, customer training or as a marketing and recruitment tool.

Some of these tools would need to be created by the organisations themselves whilst others could utilise 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 organisation. When taking into account the differing levels of the use of eLearning in organisations, it is clear that MOOCs have the potential to complement traditional face-to-face offerings, particularly in, but not limited to HRD. Further MOOCs for business need to be focused on practical activities relevant to the organisation concerned, be up-to-date and reflect current best practice.

Another expectation was that MOOCs could help building confidence of learners (students, employees or unemployed). A number of interviewees highlighted that MOOCs currently appear to offer no employability benefits to learners who have never had a career or have a low level

of education. However, MOOCs were perceived as potentially widening the network of learners in addition to providing quality and up-to-date information, which could make a difference when looking to apply for a job or advance one's career.

MOOCs are not just a way of offering employee training free at the point of use, but also provide a complementary tool for higher education, vocational education and lifelong learning as well as a complementary education tool that might facilitate continuous development of the employees. MOOCs can be used by secondary schools, at work, within lifelong learning contexts etc., but should also be used to educate at scale and could be used for public service announcements and as a tool for businesses to engage with their customers and potential customers. MOOCs are suitable for large organisations that have offices in multiple locations. In the instance of small to medium sized organisations, MOOCs could be a way of ensuring up-to-date training as offered to employees in instances where there is limited or no available budget for training, or no HRD/eLearning unit.

Findings from our interviews showed that a large number of organisations are considering MOOCs as a way of training their employees, particularly in health and safety where standards are informed European legislation and therefore training materials can be easily reused in different contexts. However, creating MOOCs on health and safety would need to involve expertise and services that would initially need to be paid for.

Collaboration with Business

Regarding the potential collaboration between HEIs and businesses, a number of topics were highlighted covering both soft and technical skills. However, to enable potential collaboration between these two sectors, work would need to be done to address prior negative experiences of eLearning and the association of free of charge courses as being lower in quality.

Other issues that need to be addressed include digital literacy, Internet connectivity and a lack of experience with online learning. In addition, perceptions of existing MOOCs as not addressing core business competencies, but being focused on "trendy" topics (such as e.g. artificial intelligence – however, the authors of this paper observe a strong shift towards business and management topics offered by MOOCs; for example, Class Central (2017) lists at the time of writing this report 1.125 business & management courses, almost twice as much as topics in other categories), privacy concerns and existing policy around eLearning and training were also cited by participants as possible barriers to collaboration between HEIs and businesses with regard to MOOC production and use.

To enable collaboration between businesses and HEIs, the role of regional/national legislation and initiatives to promote MOOC use/creation could be useful. Initiatives would contextualise, promote and incentivise collaboration and endorsement from regional and national government would help strengthen and reveal the relevance of MOOC to businesses.

PART II

EFFECTIVE PRACTICE IN MOOC PROVISION

DESIGNING YOUR MOOC

Designing a MOOC can be intimidating, especially if you are not an educator or educational technologist by profession. Here we present some key pointers and practical advice to get you headed in the right direction.

Top Tips

Here are our recommendations for things to think about in the process of putting together a MOOC:

1. **Do your homework regarding the choice of topic(s) and your target group(s)**

Do some research into the kinds of MOOC that are already available in the area of interest. (You could start with MOOC aggregators like Class Central or MOOClist and then scan the major MOOC platforms, but be aware that not all MOOCs are listed there.) Speak to your target group, the potential learners: What do they think? What would they need? How would they like to learn that topic? Speak to decision-makers and multipliers: What do they think? What do they need? (e.g. look at the competence framework of companies). If it is not possible to engage directly with learners or companies, apply market/customer analysis tools, such as [Personas](#) or the [Empathy Map](#).

2. **Carefully select the platform which fits to your type of MOOC as well as to your audience**

Is the platform you choose going to give you all the functionality you require? Does it support any collaboration activities (if desired)? Is the sign-up procedure simple enough for your target audience? Is the platform professional enough for your target audience? What about accessibility of content on different (mobile) devices and for different types of users (age, profession, sector, experience, education, confidentiality, security, legal and technical issues, specific needs etc.)? Who owns the uploaded content? Consider openly licensed content and keeping track of assets via an asset log.

3. **Design your MOOC to engage appropriately with as many learners in your target audience(s) as possible**

Consider that familiarity with MOOCs varies among learners. Be clear about who your target audience is and understand their learning outcomes. Consider providing MOOC content in multiple languages (which can incur additional costs and effort). Include examples or activities which reflect specific target audience(s) localities/circumstances. Try to offer additional community building activities, which differentiate your MOOC from others (e.g. closing event, outtakes from videos etc.)

4. **Use educational design tools and well-approved didactical approaches**

Familiarize yourself with different tools. Choose an appropriate [learning design framework](#) (and adapt it to your needs if appropriate). This will help you structure the development process and ensure your MOOC delivers on the intended learning outcomes.

5. Get early feedback by running pre-tests with your target Group

Estimate the required time to complete the MOOC and specific activities upfront and test it with your target group. If possible, let representatives of your target group try out an early prototype of your MOOC in front of you and observe them. Collect your observations and improve your MOOC design accordingly.

6. Focus on the first week and “ice-breaking activities”

Provide inviting and engaging first activities: easy to accomplish and clearly related to the subject area. The entry barrier should usually be low (except maybe for some highly specialized MOOCs), maybe integrate some “fun” element if it fits to your target group. Incorporate an interactive element and try to stimulate a discussion (less applicable to self-paced MOOCs). You can easily raise the level of difficulty in activities later on in the course. Carefully consider what fits to your target group and topic!

7. Strike a good balance between different forms of activities and resources

MOOC learners appreciate a mix of reading, watching diverse video materials, doing self-tests, quizzes, taking part in discussions etc. This diversification helps to cater different learning types/styles, it potentially introduces deeper learning processes and a self-reinforcing learning loop. Multimedia is important, but only if the content is good. Include links to a wide range of resources (including non-English websites and other materials learners might find useful) so that the learners can deepen their knowledge by themselves.

8. Make impactful multimedia content

Stick to the point: shorten videos to cover essential content only. If a topic cannot be explained in a 3-5 min video, split it into two or more “digestible” parts. (It makes a huge difference for your learners!) Make sure your videos feature diverse resources and examples. Avoid long welcome and farewell procedures in the videos, and don’t repeat what has already written/communicated. For videos added while the MOOC is running (such as weekly summaries), the learners do not necessarily expect the same high quality of the video recording (but typically do expect the learning content of these videos to be of good quality).

9. Hints for designing multiple-choice assessments

Consider running pre-tests with people unfamiliar with the topic and incorporate their feedback, making the questions meaningful and directly aligned with the course’s content. Avoid vague wording, double negatives, and unclear or complex answers (though sometimes vagueness can be a strategy to promote more active learning in some cases.) Consider providing self-training options with similar questions that learner can train and get familiar with your style of multiple-choice questioning.

10. Seek to reuse existing content

Many, many openly licensed useful materials are available and can be reused in a new MOOC. Ensure that you take time to review existing content and assess whether it can be integrated successfully into your new MOOC. While a MOOC with a lot of external content potentially allows for faster implementation, this will potentially require higher levels of maintenance in the long-term. The possibility of “link rot” and external resources being removed or links not working anymore means that solutions or alternatives may need to be found. However, in the instance of openly licensed resources re-use also enables the original material to be tailored to the context and specific goals and target group of your MOOC. i.e., reused materials (videos, educational material, assignments and quizzes) can be adjusted to the course, made available on the MOOC

platform and include a reference to the original resource. When existing videos cannot be re-edited, it is advisable to only let the video play relevant sections instead of the whole video (although this creates interdependencies with external sites and needs regular checking/permanent maintenance).

Lessons Learned in BizMOOC

The following list are 'lessons learned' from the implementation and evaluation of three pilot MOOC within the BizMOOC project (See [Chapter 20](#)).

1. **Platform choice and functionality** are important considerations when developing a MOOC. Ensure that you assess the platform and that it meets your needs and has the functionality you need for the course.
2. **Not every course platform is applicable** for each type of MOOC.
3. **Sign-up procedures** should not be too complicated and long (e.g. only a few mandatory requirements such as name, e-mail and password plus some optional such as birth date, language, location etc.).
4. Note that MOOCs are about massive numbers of learners participating in a course. Aligning with **regional, national or even global platforms** helps to cater to the needs and quality expectations of a (critical) business audience and potentially attract a lot of learners. This is an important consideration alongside the required functionalities of the platform.
5. **Accessibility** of content and assets (such as videos) **on different devices** is important.
6. **Transcripts can be essential** as many learners are not native English speakers, may not have good/reliable connectivity or prefer this format over video/audio. Build in time and resource to subtitle videos and ensure that text is in a screen reader compatible format.
7. **Design tools and well-approved didactical approaches** (in our case Learning Design by the Open University UK and the e-Learning concepts by Gilly Salmon) facilitated the course production process well. See good practice for examples.
8. **Choice of topic and relevance for target group:** A needs analysis with desk research about existing offers (MOOCs and other formats), with the targeted learners and qualified experts about the intended course topic, their expectations and how they would like to learn is critical.
9. **Familiarity with MOOCs varies** among learners and should be considered both in terms of design and presentation of course content. Moreover, not all are self-directed learners.
10. **A diversity of activities is appreciated by learners** (reading, watching videos, quizzes, forum discussions, etc.) and potentially deepens the learning process.
11. **Multimedia** is appreciated by the learners (but only if high-quality in terms of content and technical features)
12. **Summaries of each module are appreciated**, but only if they stick to the point and provide a good recap with minor new elements. This could be done at the end of each section.

13. **Completion rates are just one indicator for the success of a course**, consider also other indicators such as the learners' engagement with content, the quality of their contributions, their feedback, expert feedback and review, level of participation over the weeks, etc.
14. In addition, become aware of your **learner's intention beforehand** (e.g., by a pre-course survey) and contrast your success measurement with this (e.g. with learning analytics, with a corresponding post-course survey, with follow-up interviews)
15. **Multiple choice questions** are not easy to design, especially for soft topics. Important to allow plenty of time to design meaningful quiz questions, run pre-tests and ensure you are developing your assessment in conjunction with your course content
16. **Re-use of materials** with open licenses works to some extent, but only when relevant and useful materials are carefully selected.
17. **MOOC closing events** are a good opportunity for an informal reflection, but need to be planned and announced in advance (e.g. at the start of the course) with a description of what to expect, how the event will work etc.
18. **Outtakes from video production** are not essential, but they add a more informal and personal touch to the online experience for the learners and the development team.
19. Additional **On-Site Exams** are only taken by very few learners, but can be useful when the MOOC is part of University course/program and enables students to gain additional ECTS points.

ENCOURAGING ACTIVE PARTICIPATION

Two really significant challenges for MOOC management is ensuring that learners are actively participating on a course all the way through to the end. These are the lessons we learned through our own experiences of MOOC teaching that relate to participation and completion.

1. Consider your target audience(s) when setting the **launch/start date of your course**.
2. **Required time** for MOOCs and specific activities is hard to estimate upfront, but important for your learners.
3. **Different course tracks/pathways** to reach different levels of knowledge are appreciated, but may lead to confusion as well. Different tracks/pathways must be clearly structured for learners.
4. It is also difficult to reach an adequate level of “**strictness**” **with deadlines** (soft vs. hard deadlines) to not scare off learners. Do you want to grant soft deadline to make it easier for learners with busy schedules, or do you go for strict deadlines to award those which take the deadlines serious?
5. It is important to **not only promote enrolment**, but also participation/completion from the beginning, presenting learners with benefits/take-aways of completing the whole course.
6. However, some learners do not come with the intention to **complete the MOOC**, for example, they might just be interested in a particular section/week of the course, or in “lurking” (e.g. to see how the MOOC is done)
7. It is important for learners to be able to **track their progress** in a course. It also provides the course creators with information about how the course was being used (note, this is only possible if learners have to sign-in for the course and consent to be tracked).
8. Well-designed, “ice-breaking” **activities are key for active participation** and learner engagement. Learners can get to know each other and connect more quickly (in a set timed MOOC, not applicable for a self-paced MOOC).
9. Learning in teams/**teamwork can be a challenge** (online and face-to-face), because of differing levels of activity, knowledge and engagement (e.g. free-rider problem). Moderation helps for less active learners, but hardly turns inactive users into active ones. It is critical how the assignment and assessment is designed (e.g. peer-review within and between teams). Next, teamwork is also difficult for self-paced MOOCs – does one

monitor forums for month after month, or just offer active forum contributions from moderators during a set time?

10. **Languages:** Sometimes (especially in certain regions) this can be a challenge. It can be a trade-off between facilitating access for more people (by providing several languages), but at the same time decreasing the cross-cultural exchange within the MOOC (by having separate language communities).
11. **Multi-lingual courses** require a lot of additional resources (not only translation of content, also multi-lingual moderation, platform and course design, technical support etc.). Publishing content with an open license offers the opportunity for translation into other languages.
12. Localising a MOOC by offering opportunities to **reflect on the local context** of the learners, for example, by designing activities where participants share local examples, makes content more relevant and potentially more engaging.
13. **Certificates** are motivating for some learners, for others not (approximately 50:50 over all MOOCs). If the certificate is officially recognized by a company or university, this number significantly increases.
14. Be careful with **mandatory participation** (e.g. if you force students or employees to take a MOOC). If you did want all employees to participate in a MOOC, provide them real incentives to do so (e.g. provide them time).

Convenience

It's important to offer your learners a sense of convenience in terms of when and where they study.

- Apply an **easy and convenient sign-up procedure**. This might be another criteria for choosing your platform.
- If the MOOC is facilitated and run in set time, **respect your target audience's schedule**. It is especially important to provide clear advice on the:
 - length of the MOOC, each section and the estimated time activities shall take;
 - when you should start and finish your MOOC (timing of the whole MOOC);
 - when you will publish new content. When scheduling this consider business schedules, working/free time, weekends, holidays etc.
- **Run a pre-course survey and consider expectations and prior knowledge** of your learners, as this also influences the success rate and the estimated required time to participate in the MOOC. For example, if the knowledge gap is too large to start the course effectively, offer some additional material and refer to other courses to help scaffold learners effectively.
- If supported by the platform, **offer flexibility to your learners** with different course paths:
 - Define minimum participation requirements;

- Scan your MOOC and mark “must-have” content and “nice-to-have” content to help your learners with limited time to complete the essential components of the course;
 - Consider offering a “fast track” which comes with a minimum certificate;
 - Provide different opportunities for deepening one’s understanding of complexity of the subject;
 - Offer a range of next steps aimed at different levels or contexts.
- Provide (realistic) **estimated workloads** for the modules and activities so that learners can plan their contributions.
 - **Try to strike a balance between being strict vs. flexible**, for example with exam deadlines for a business audience. Moreover, we would not suggest to grant too much time for an assignment or task (e.g. 5 hours for a peer-review which takes only 30 min.), as this can be misunderstood and scare off your learners. Keep expectations realistic!

Communication

It’s also important to think about how you communicate with your learners.

- Promote course enrolment, but do not forget to also **promote course participation and completion**.
- Be clear about how you will communicate with participants at the start of course.
- Send **reminders to learners** on a **regular** (e.g. weekly) basis.
- If you start with regular reminders, ensure that you **stick to your communication policy** until the end of the MOOC. Your learners will get used to it, rely on it and appreciate this.
- **Be concise and easy-to-follow with instructions** and descriptions, especially when it comes to deadlines and group work requirements.
- **Stimulate your learners with easy and fun “ice-breaking” activities**. Once your learners became visible, it is much more likely that they will stay active in your MOOC.
- **Provide overviews/summaries** for each module/week, but focus on the outcomes of the discussion, what was new/new content/interesting points from forum discussions/areas of the course people found difficult and/or activities/conclusions. Do not summarize the task descriptions or regurgitate content already available in the MOOC.
- Depending on platform functionality, enable learners to **track their progress** and motivate themselves appropriately. This gives a better overview, motivates and also provides the course creator with information about how the course was being used.
- **Ongoing feedback** at the end of learning milestones or sections/weeks help to keep learners motivated and engaged.
- There should be a clear **indicator of progress** in the MOOC for the learner after each module/course section.

- **Consider an official closing event** (if not self-paced): especially when offering MOOCs over a longer period with active user participation. When offering such an event, we recommend:
 - considering the **form of the closing event** (for example a hot seat (<http://dbp.theatredance.utexas.edu/content/hotseating-0>), but always include different ways of participation for learners, e.g. in an online hang-out, YouTube livestream, in a chat forum, etc.)
 - communicating the **date and purpose at the beginning** of the MOOC;
 - preparing your **own inputs** (e.g., share outtakes of the video recording, some background stories (what happened behind the scenes), etc.) and **leave room for your learners** to feedback;
 - offering a Social Media follow-up exchange place, e.g. a LinkedIn Group or other networks, if appropriate.
- **Encourage your learners to become co-creators** of your MOOC and potentially create a ‘community’ around your course, by:
 - inviting learners to design specific activities/assignments (see good practice) or use material/resources developed by learners during the MOOC in future iterations (you will need make it clear in the introduction to the MOOC that this will happen, how these will be licensed and enable people to opt out, etc.);
 - initiate stimulating discussions;
 - acknowledging their level of expertise and experiences;
 - asking for their feedback and opinions;
 - and by not answering every discussion/question in the forum. In some cases, fellow learners responded to questions and subsequently became “co-mentors” of the course. Be more reflective and engaging instead of assuming that you as the course creator are the only expert on the topic.

Community

It can be really important to create a sense of teamwork and camaraderie among MOOC learner cohorts.

- **Carefully design group selection process and criteria:**
 - Bottom-Up vs. Top-Down: let the participants choose/suggest co-learners for their group who they already know from discussions according to preferences/sympathies/similar thinking vs. an automatic group building via fixed criteria (e.g. time-zone, languages, topic, time budget etc.).
 - Be aware that bottom-up instigated teams could be time intensive and require a high level of responsibility from your learners; typically, only very few, highly-engaged learners will do this.
- Create the teams **as early as possible** in the MOOC to enhance a sense of belonging. It’s

important to be aware though, that if you assign groups at a later stage in your MOOC, a lot of inactive learners may already have dropped out (self-selection) and the ones which have stayed the course are more likely to stay active in the group work.

- **Design the collaborative activities** for a team of MOOC participants carefully; they should be **engaging and output related**. Also counteract for possible free-riding (e.g. with a peer-reviewing scheme) and facilitate possible meetings in person (e.g. by using same location as one criteria for grouping teams)
- **Strengthen the discussion part**, and make it as user-friendly as possible (with moderation, overviews, etc.)
- **Strengthen the role of moderators / mentors** (e.g. by official introduction at the beginning of the teamwork, establishing common rules, etc.)
- Complement online groups with **Social Media interactions**, e.g. by providing a personal message tool (or profile link to LinkedIn account)
- Complement online groups with **offline meeting options**: for this, geographical proximity must be a criterion for building the teams.

Credit

Finally, certification or accreditation can be an important motivation for some students.

- **Badges and/or a certificate of participation could motivate** approximately 50% of your learners. Yet different participants have different needs and preferences. A student could be interested in a certificate she/he can use at her/his university, while an employee might be interested in a certificate for career-related motives.
- **Various kinds of certificates coupled to various course-tracks** might help motivation, but might also complicate the delivery of the MOOC. Find the right balance between motivation, flexibility, the needs of your target group and simplicity.
- A **formal course recognition** with ECTS (European Credit Transfer System) or similar motivates and increases learner engagement/interest with the course.
 - For recognition etc., you can also explore our discussion paper (<http://bizmooc.eu/papers/certification/>) on recognition and certification of MOOCs.
 - Consider whether your MOOC could potentially become an **element of a certified larger programme** (e.g. a regular ECTS-based university offer, an official company training programme or even part of a Micro-Credential)

MOOCS IN THE WORKPLACE

MOOC are an innovation which began in higher education institutions, and most MOOC knowledge is still located in (or supported by) academia. In a business context the interest in MOOC is often more pragmatic, and has a different focus. Our general advice for introducing MOOC in the workplace is as follows:

1. Carefully select your **course topic**: is it appropriate to be learnt via the MOOC format? Does it make sense to be taught to a critical mass of business learners (is there a need)? Does it facilitate key business competences and career-related motives?
2. Identify your target group's expectations because this can have implications for the **professional appearance** of the platform, videos, usability, design, etc. and **quality standards**
3. Ensure an **easy sign-up procedure**
4. Provide the option for learners/employees to **stay anonymous** in the MOOCs: build trust from the beginning. Sharing can still happen without giving away names of people and organizations.
5. **Monitoring** participants' activity, inputs and comments can offer **useful data/analytics** which can enable further improvements to the MOOC, focused moderation and upcoming MOOCs for target business participants.
6. **Convince the key decision-makers** in companies by preparing a **strategy** to introduce your MOOC concept: ensure it is aligned to company strategy and work on the key selling points and benefits
7. Be aware your stakeholders **might not be familiar with MOOCs**, and might lack some (digital and language & terminology) skills next to prior knowledge, etc.
8. Check the **adaptability** your MOOC. Could the MOOC be reworked **to fit a company learning program**/catalogue and/or aligned/adapted to a company competence framework? Can the (tailored) MOOC become **part of the official training program** of a company? A closed operating environment section for the company within the open MOOC could help to address confidentiality and legal issues. Establish whether your MOOC concept is a **complementary or supplemental offering**.

After reflecting on our own experiences as MOOC providers, we make the following recommendations:

1. In our experience MOOCs for companies are successful, especially when offered in a **hybrid** training model format, **complementing** the corporate training program or **supplementing** corporate offerings.
2. MOOCs can compete with other proprietary business training, not only because they are for free, but also because they enable learners to potentially **connect** with many working professionals around the world and produced by quality providers like Higher Education Institutions.
3. The **majority** of our learners **came with career-related motives**, especially to improve skills & to learn new things (more than 70% in all MOOCs).
4. Some of the MOOC **enrolment procedures** elicited negative learner feedback regarding the number of steps and provision of personal data needed to enrol. This which might put off some registrations from business learners.
5. We observed that MOOCs can be a great way to introduce a **massive audience to a new topic/idea**, and then **follow up** with a complementing, tailored offline or blended format.
6. Many identified **key barriers** in our research at the beginning of the project (legal limitation, confidentiality issues, technical issues) were not observed during our facilitation of the Pilot MOOCs. This is perceived to be due to the fact our MOOC were not “official” company offerings.
7. According to our research, still many companies simply don’t trust MOOCs yet, so it is important to **build trust through professionalism**.
8. It is important to keep available the option to **stay anonymous when taking MOOCs**.
9. Finally, the real **added value of a MOOC compared to other learning formats, could be the power of the cloud**, the aggregation of knowledge around a topic by a massive amount of learners and experts with different cultural backgrounds.

TEACHING & LEARNING IN A MOOC

Teaching and learning is different in a MOOC than a traditional classroom context. This chapter examines the pedagogies (theories of learning) associated with different types of MOOCs. It explores how the historical development of MOOCs led to two main schools of thought regarding pedagogy, and examines the European context. The influence of learning design and open pedagogy is also considered.

Historical Developments

In examining the pedagogic approaches taken by MOOCs, it is necessary to first consider their history. MOOC are still often classified into two types based on two emergent models, though many variants have been identified since MOOC were popularized. The development of open courses initially grew out of the broader open education movement. There was a coalescence of interest around running open courses from a number of people associated with open education. David Wiley ran a campus based course in 2007, and made it open to anyone online to participate, as did Alec Couros, operating an 'open boundary' course. However, the title of founding MOOC is often given to Connectivism and Connective Knowledge (CCK08) run by George Siemens and Stephen Downes in 2008 (Downes, 2012). It was commentary on this course that gave rise to the term MOOC (jointly attributed to Dave Cormier and Bryan Alexander).

These early MOOC experiments were characterised by an interest in exploring the pedagogic possibilities offered by being both open and networked. The subject matter of these early courses was related to the mode of presentation, so courses were in topics such as open education, digital identity or networked pedagogy. As with early e-learning courses which would often be about the subject of e-learning itself, these early stages of experimentation focused on subjects where the medium was the message. But as with e-learning, this soon broadened out to encompass all topics.

Another characteristic of these early MOOCs was that they were experimental in terms of technology, both by necessity and design. These MOOCs used a combination of open technologies, such as WordPress and Twitter, some institutional hosting through tools such as Moodle, and even some self-created tools such as Stephen Downes's gRSShopper. Learning to use these tools, and to make connections across the open internet was seen as a key aim for these early MOOCs.

Then in 2011, MOOCs took a very different turn when Sebastian Thrun launched the Stanford Artificial Intelligence course, with over 120,000 enrolled learners. This attracted much media attention and other universities followed suit. Harvard and MIT created EdX, Coursera was launched by Daphne Koller and Andrew Ng with venture capital funding and Thrun founded

Udacity. The year 2012 was deemed 'Year of the MOOC' by the New York Times (Pappano 2012) as most major US universities signed up to one or other of the main providers, or launched their own courses. If we take Coursera as an example, as it is the most prominent of the MOOC providers then it has over 500 courses, from 107 universities and over 5 million learners enrolled (Protalinski 2013). Pedagogically these new MOOCs were very different from the early ones pioneered by the open education movement. They tended to be institutional, based on a proprietary platform and driven by a strongly instructivist pedagogy. Whereas the initial MOOCs had emphasised the importance of networking, many new MOOCs were focused on video instruction and automatic assessment. The distinction was made between cMOOCs for the early, connectivist type MOOCs and xMOOCs for the new, didactic models (Siemens 2012).

Theories of Learning in a MOOC

According to the cMOOC/xMOOC distinction, the approaches to pedagogy found in MOOC fall into two types:

Connectivist or cMOOC

- Based on connectivist theories
- Emphasis on connecting learners rather than presenting content
- Focused on networks
- Learners often involved in construction of the curriculum

xMOOC

- Modelled on traditional course materials, theories and teaching methods (e.g. lectures)
- Video content and automated testing or quizzes
- Linear, instructor-guided
- High quality content

This distinction is arguably overly simplistic as there are often collaborative elements in xMOOCs, and also cMOOCs can be quite structured. It is perhaps best to think of the cMOOC/xMOOC distinction as a continuum, with very structured, linear at one end and loosely structured, networked at the other.

To this dichotomy a range of variations has been added, including SPOCs (Short, Private Online Courses), VOOCs (Vocational Open Online Courses), SOOCs (Selectively Open Online Courses), mini-MOOCs, mobile MOOCs, etc (Baynes & Ross, 2014:22). This flurry of acronyms demonstrates is that MOOCs inspired a resurgence in interest in elearning generally, even if some of these variations seem to get quite far from the original characteristics of MOOCs being open.

While different pedagogies may be suitable for different topics, or groups of learners, it is often argued that one is 'better' than another. This will depend on the goals of the MOOC. Jordan (2014) conducted a study of MOOC completion rates. The most significant factor influencing dropout rates was course length (with shorter courses have higher completion rates). The MOOC platform and the MOOC type (cMOOC vs xMOOC) did not have an impact on completion rate (although the data was limited to only thirteen MOOCs this comparison).

State of the Art

In terms of pedagogy the early experimental phase of MOOCs was soon superseded by a focus on platforms and business models during the period of MOOC expansion. While many of the xMOOCs are high quality production, in terms of pedagogy they are often limited, based on passive video watching and taking online quizzes. However, having gone through this phase of early enthusiasm, there is some evidence that universities are now becoming interested in pedagogic experimentation again. Since MOOCs rarely confer formal study credit and are not paid for by learners, they are the ideal vehicle for conducting experiments. This can be in terms of A/B testing, for example testing different resources, the placing of these resources within a course, new technologies, etc. By running these across two separate presentations of the same MOOC and controlling other variables then the impact of one aspect on performance can be isolated.

Another area of interest is in the use of learning design in implementing and evaluating MOOCs. In the UK JISC and CETIS funded a number of learning design projects, which, as with OERs, had the benefit of raising awareness of the approach. One large project was JISC OULDI (<http://www.open.ac.uk/blogs/OULDI/>) which developed a number of learning design tools. FutureLearn runs regular learning design workshops for its partners, using the Open University adaptation of these tools.

Future trends in MOOC pedagogy will be influenced by other factors, particularly the sustainability of MOOCs overall. Several studies have now been published on how learning happens in a MOOC context, providing a base for thinking about how to develop MOOC provision more effectively in future:

- Tseng et al. (2016) identified three basic types of MOOC learner: active learner, passive learner and bystander. They suggest that the first two weeks of presentation are critical for engaging learners effectively.
- In a review of activity on EdX, Chuang & Ho (2017) note that enrolment, unique participants and certification all continue to grow.
- Increasingly learning analytics is used as a way to evaluate MOOC activity with minimal human input – this leverages the huge datasets typically created by MOOC platforms (Khali & Ebner, 2017)
- Littlejohn & Hood (2017) have highlighted the discrepancy between seeing MOOC users as consumers and as learners, arguing that more needs to be done to support self-directed learning if MOOC are to make good on their claims to be democratizing and disruptive.
- Much MOOC research remains based in mixed methods data on learner motivation, retention and completion, and instruction design (Zhu, Sari & Lee, 2018).

Stacey (2013) makes the following recommendations regarding open pedagogy:

- Be as open as possible. Go beyond open enrolments and use open pedagogies that leverage the entire web, not just the specific content in the MOOC platform. As part of your open pedagogy strategy use OER and openly license your resources using Creative Commons licenses in a way that allows reuse, revision, remix, and redistribution. Make your MOOC platform open source software. Publish the learning analytics data you collect as open data using a CC0 license.

- Use tried and proven modern online learning pedagogies, not campus classroom based didactic learning pedagogies which we know are ill--suited to online learning.
- Use peer-to-peer pedagogies over self-study. We know this improves learning outcomes. The cost of enabling a network of peers is the same as that of networking content – essentially zero.
- Use social learning, including blogs, chat, discussion forums, wikis, and group assignments.
- Leverage massive participation – have all students contribute something that adds to or improves the course overall.

IMPROVING QUALITY

This chapter elaborates different views on quality process and provide overview of different quality frameworks and practices used. the different dimensions related to the quality of MOOCs. First, four different kinds of perspectives are identified as 1) learner’s point of view ; 2) pedagogical framework of MOOCs ; 3) input elements 4) output measures. Second, a worldwide review to quality models of online education is discussed along with more holistic quality labels. The importance of a national or international quality framework which carries with it a certification or label is illustrated with the OpenupEd Quality label.

The concept of online education quality can be interpreted from various perspectives many dimensions. One perspective is the quality of products and/or of processes. Quality can be viewed from the perception of many stakeholder involved (“in the eye of the beholder”): not only learners and educators, but also higher education institutions (HEIs) and MOOCs platform providers, quality agencies, government, potential employers and others who might recognise achievement in a MOOC. This multi stakeholders perspective considers quality as “conformance to requirements” (Crosby, 1979). Assuming the existence of a set of requirements that an institution is offering to MOOCs and of its learners, this perspective is described in such a way that no misunderstanding is possible.

Another perspective concerns “fitness for use” (Juran, 1998). For a MOOC, this formulation assumes a group of users, within which everyone has their own requirements and expectations of MOOCs. Although both views appear to be unrelated, they complement each other in reality. In addition, Nordkvelle, Fosslund & Nettleland (2013) states that quality could be examined from the macro (national/global), meso (institutional) and micro (course/module) level.

Consequently, quality assurance of MOOCs cannot be easily standardised. Even within one single MOOC there is not any uniform aim among actors involved (institution, responsible teaching staff and participants). Since MOOCs are designed for various target groups– even within one target group– motivations and intentions of MOOC participants vary greatly. Hence, quality systems will differ by the level and the aim.

Quality of MOOCs can be considered from the following four dimensions (see also Jansen et al, 2016):

1. Quality from the learner’s point of view.
 - A participant might select a MOOC based a notion of brand reputation attached to the MOOC platform, such as the originating institution, and the course author.

- Other quality dimensions are needed, such as one that is related to learner satisfaction. Some MOOC portals enable people to rate different MOOCs by their platforms and providers.
- Considering quality from the perspective of learners requires an engagement with diverse goals, expectations, learning behaviours, and abilities of learners to facilitate their own learning.
- MOOCs attract a diverse range of learners, who come from different backgrounds and have a wide range of motivations for enrolling in a particular MOOC (e.g. Hill, 2013; Kizilcec, Piech & Schneider, 2013).
- To make the personal learning objectives more visible, experiments with digital badging systems can be applied (Schön et al. 2013)
- In addition, schemes can be applied to measure the motivations and intentions of participants (Kalz et al., 2014).

2. Quality connected to the pedagogical framework of the MOOC

- The pedagogical model of MOOCs should be designed to scale gracefully to unlimited numbers of participants, meaning that the teaching and support efforts **do not** increase significantly as the number of participants increases.
- Current research begins to examine qualitative indicators for the dialogue and the interaction that can guide the choice of pedagogical model.
- Downes (2013) has formulated four key factors to success in this area: autonomy, diversity, openness and interactivity.
- Dalziel et al. (2013) describes different learning design principles that could be applied to MOOC as well.

3. Quality related to the input elements

- This may include aspects such as instructional design, the content and resources, multiple choice questions and assessments, the deployed technology, and the quality of instructors. These aspects are aligned in the conventional criteria of course quality.
- Margaryan et al. (2015) evaluated the instructional quality of 76 MOOCs and concluded that they all scored poorly overall.
- Lowenthal & Hodges (2015) reviewed six MOOCs applying quality schemes intended for traditional for-credit online courses. They concluded that “two of the MOOCs passed the review and therefore could be considered as high quality online courses”.
- Costello, Brown & Holland (2016) found a number of flaws when analysing the multiple choice questions on several MOOCs.

4. Quality based on outcome measures

- These might include the number of learners who complete a MOOC or achieve the certification. These metrics are (relatively) easy to be measured.

- Neuböck et al. (2015) and Macleod et al. (2015) have confirmed the earlier findings by Hollands and Tirthali (2014a, p. 42) that only “3% to 15% out of the total enrollers completed a course”
- MOOCs mostly attract well-educated learners who already have higher education qualifications, and are employed (Macleod, Haywood, Woodgate & Alkhatnai, 2015).
- Learning outcomes can also be measured qualitatively. This overlaps with the first dimension, namely, the quality from the learner’s point of view can be measured through the pre- and post-test of the motivations and intentions of MOOCs participants.
- However, due to the fact that not all learners follow the instructional pathway of a MOOC, taking the completion rate as a measure for the quality of a MOOC has therefore been criticised (e.g. Jordan, 2015). It is argued that the low values of conventional measures, such as retention and completion rate, may not signal poor quality.

Until now the quality of MOOCs as reviewed according the one or more best standards and norms according to above dimensions. In this the quality system is characterised by externally set norms and often focus on MOOC as a product. Examples of checklists openly available are those by edX (many focussing on MOOC development) and those by ECO project (one focuses on pedagogical, another on review implementation). In addition OpenupEd published several checklists that supports universities in self-assessing their MOOC development (see below). The BizMOOC project re-used these checklist as part of the overall quality assurance and evaluation procedure in the three MOOC pilots.

Ossiannilsson et al. (2015) have studied the existing quality models for online education, including MOOCs. They have identified and analysed several quality models worldwide. They categorised these quality models by the following functions and uses (p7-8):

- certification granting a label as a level of recognition after some form of review
- benchmarking as a comparison of institutional performance with that of others
- accreditation as a form of mandatory certification or licensing by formal regulatory agencies
- advisory purposes offering structured guidance

In addition they align different quality systems based on a maturity model: low maturity systems are characterised by norms being set externally and a focus on product, whereas in high maturity quality systems institutions have embedded processes aiming at quality enhancement towards their own objectives. The latter focuses on quality process.

Ossiannilsson et al. (2015) found that most models take a holistic view of quality, recognising the need to address many aspects of an enterprise. Quality must be seen as the result of the application of a systematic process of design and evaluation with the aim to improve that over time. As such, the quality enhancement for MOOCs is an iterative process, and the design methodology at different levels of granularity can support this.

Ossiannilsson et al. (2015) developed eleven recommendations regarding quality assurance for online education. Regarding MOOCs, they in general state that one needs to apply

generic quality systems to MOOCs that allows high degree of flexibility, contextualisation and allows for designing personalised quality management system. In addition, they recommend that one needs to a) support audits and benchmarking exercises; b) make these applicable to non-traditional MOOC providers as well (unbundling); c) address quality issues concerning credentialisation through qualifications frameworks and d) encourage, facilitate and support the implementation of quality assurance.

The OpenUpEd Quality Framework

If there is a consensus that this range of dimensions is appropriate for e-learning generally, it seems appropriate for MOOCs to use a similar framework. Based on the E-xcellence framework a quality model for MOOCs was developed.

The OpenupEd Quality label (Rosewell & Jansen, 2014) describes a self-assessment and review quality assurance process for the MOOCs on the European OpenupEd portal, but this OpenupEd framework can be used for quality assurance of any MOOC. The partners in OpenupEd have a commitment to opening up education through MOOCs to the benefit of both learners and wider society. To this end, partners endorse the eight distinctive features described in Table 1 as the guiding principles for their MOOCs offering. The OpenupEd Quality Label requires courses to address openness to learners and open licensing and is thus firmly rooted in the Open Education movement (next to online education). As such the OpenupEd label requires that the quality of MOOCs are “fitness for use” (Juran, 1998) to these features.

OpenupEd distinctive features	Explanation
Openness to learners	This captures aspects such as: open entry (no formal admission requirements), freedom to study at time, place and pace of choice, and flexible pathways. A broader perspective stresses the importance of being open to learners' needs and providing for a wide variety of lifelong learners.
Digital openness	Courses should not only be freely available online but also allow application of open licensing so that material and data can be reused, remixed, reworked and redistributed (e.g. using CC-BY-SA or similar).
Learner-centred approach	Courses should aid students to construct their own learning from a rich environment and to share and communicate it with others; they should not simply focus on the transmission of content knowledge to students.
Independent learning	Courses should provide high quality materials to enable an independent learner to progress through self-study.
Media-supported interaction	Course materials should make the best use of online affordances (interactivity, communication, collaboration) as well as rich media (video and audio) to engage students in their learning.
Recognition options	Successful course completion should be recognised as indicating worthwhile educational achievement.
Quality focus	There should be a consistent focus on quality in the production and presentation of a course.
Spectrum of diversity	Courses should be inclusive and accessible to a wide diversity of citizens; they should allow a spectrum of approaches and contexts, accounting for a variety of language, culture, setting, pedagogics and technologies.

Table 1. The distinctive features of OpenupEd MOOCs (Jansen et al, 2016)

The OpenupEd Quality Label provides a process-based quality enhancement framework for MOOCs and their providers. The benchmarks statements in this label, derived from benchmarks produced by the E-xcellence framework, are divided into two groups: those that are applied at the

institutional level and those that are designed for individual courses (MOOCs). The benchmarks at the institutional level are grouped into the same six areas as the E-xcellence benchmarks. Table 2 and 3 shows the framework at both levels, i.e. institutional and course respectively. For the institutional level, the examples (when appropriate) are derived from those that are provided as examples in the E-xcellence framework in the previous paragraph.

Institutional level

Area	Example of a benchmark
Strategic management	The institution has a MOOC strategy that is related to its overarching strategies for e-learning, open education and open licensing.
Curriculum design	The institution makes explicit the relationship between its MOOC portfolio and its mainstream curriculum.
Course design	The institution provides templates or guidelines for the layout and the presentation of MOOCs that ensure the consistency across all portfolios while maintain the flexibility to accommodate a range of teaching and learning methods.
Course delivery	The MOOC platform provides a range of online tools that are appropriate for the adopted educational models.
Staff support	The institution provides adequate support and resources to MOOC staff and manages workloads appropriately.
Student support	MOOC students are provided with clear and up-to-date information about courses including its aims/objectives, learning and assessment methods, workload and prerequisite knowledge.

Table 2: Framework for the OpenupEd Quality Label at the institutional level

In the framework of the pedagogical research developed as a collaboration with different EU-funded MOOC projects, a more comprehensive definition was adopted, which is “an online course designed for large number of participants that can be accessed by anyone anywhere, as long as they have an internet connection, is open to everyone without entry qualifications and offers a full/complete course experience online for free” (Brouns et al., 2014). In 2015, this definition has been validated amongst European institutions (Jansen et al., 2015). Additional criteria for MOOC development were defined as well.

Course level

A clear statement of learning outcomes for both knowledge and skills is provided.

There is reasoned coherence between learning outcomes, course content, teaching and learning strategy (including the use of media), and assessment methods.

Course activities aid students to construct their own learning and to communicate it to others.

The course content is relevant, accurate, and current.

Staff who write and deliver the course have the skills and experience to design and deliver the course successfully.

Course components have an open licence and are correctly attributed. Reuse of material is supported by the appropriate choice of formats and standards.

Course conform to guidelines for layout, presentation and accessibility.

The course contains sufficient interactivity (student-to-content or student-to-student) to encourage active engagement. The course provides learners with regular feedback through self-assessment activities, tests or peer feedback.

Learning outcomes are assessed using a balance of formative and summative assessment appropriate to the level of certification.

Assessment is explicit, fair, valid and reliable. Measures appropriate to the level of certification are in place to counter impersonation and plagiarism.

Course materials are reviewed, updated and improved based on feedbacks from stakeholders.

Table 3: Framework for the OpenupEd Quality Label at the course level

Quality models of MOOCs are becoming more mature. Starting from various different perspectives and dimensions, more holistic quality labels are developed based on experiences in both open and online education. These quality labels are based on existing systems of open and online education. The OpenupEd label published in 2014 is among the best elaborated based on a long history of the E-xcellence label in Europe.

BEST PRACTICES

There are many different elements to consider when putting together a MOOC! We have 20 suggestions for good practice that will help to keep you on track.

1. Learning Design Principles and Tools for MOOCs

Develop the structure and content of the MOOC using proven learning design principles and tools. There are existing, tested templates available to be used by anyone. The BizMOOC team used the design templates and methodology of The Open University. A video instruction to the Learning Design process is available from <https://www.youtube.com/watch?v=tA5K7nlQ2e0>.

2. Templates, Questionnaires and Surveys to Identify Your MOOC Target Group

Conduct research on the characteristics and needs of the target groups in the early phase of the design process. Using this information to design the MOOC should enable you to engage appropriately with as many learners in target audience(s) as possible. For example, the BizMOOC project started with interviewing both higher education institutions and business representatives to get a broad overview of the gaps and insights to needs of the target groups. It also exposed the level of familiarity of target groups with MOOCs, their presumptions, reservations and expectations. Feel free to apply the templates, surveys and questionnaires used in BizMOOC (which are available on an open licence). They can be downloaded from <http://mooc-book.eu/index/learn-more/further-readings/>.

3. Prototyping in MOOC Design

Involve experts, learners and peers in the evaluation of the design and course prototype well in advance of its launch. Anticipate several rounds of review and iterative improvement.

4. Schedule Time for MOOC Design!

Take sufficient time for the design of the MOOC. This pays off significantly during the development of the course. In our project, we started one year in advance of the MOOC's launch by defining course and learning objectives, target groups and developing an initial plan. There was straight-forward time plan (using a GANTT chart), a Project communication plan including a formal Kick-Off Meeting in combination with a workshop on MOOC didactics, regular online meetings, clearly defined milestones and a blue print in place.

5. Linguistic Tools for Translating MOOCs

Use linguistic tools to overcome language issues. A bilingual course might be a good option to overcome language barriers and engage with a larger number of potential and/or actual users. There are machine translation options for MOOC, such as the EU-funded project TraMOOC (tramooc.eu), for example. Even YouTube has semi-automatic subtitling options or one could use Google's subs – but these will need checking and correction manually.

6. Balance Out Unequal Experience Levels within MOOC Design Teams

Acknowledge and address unequal knowledge and experience with MOOCs within the design team. The BizMOOC project had MOOC teams from various background and sectors, some with hardly any previous knowledge on MOOCs. This was addressed by first producing 14 state-of-the-art papers with contributions from all team members. These papers were then reviewed by MOOC experts. In addition, a dedicated learning design workshop was held next to overall team guidance by work-package leaders experienced in MOOC development and implementation

7. Use a Course Planner Sheet to assign tasks and responsibilities

Assign tasks and responsibilities according to team member's areas and levels of expertise in support of an overall vision.

8. Quality Dimensions Review

Establish the goals, learning outcomes, characteristics and quality criteria of the MOOC before developing the MOOC. Consequently, MOOC team members should be aware of the main priorities and concerns when developing and implementing a MOOC. In the BizMOOC project, this was not only facilitated by the learning design workshop, but also by discussing the quality dimensions and criteria that apply to the project overall and the specific target group of the MOOCs.

9. Key Performance Indicator Dashboard

Select and measure key performance indicators that are most appropriate for the MOOC. During the design phase, the BizMOOC project discussed the key criteria that guarantee the quality of each MOOC. As part of this process many pre-existing quality checklists, questionnaires for experts and MOOC participants and other tools were re-used.

10. MOOC Evaluation Design

Plan the overall evaluation and quality process, including who will review what elements using which template with applicable criteria, beforehand. In the BizMOOC project, we agreed to have a review of the MOOC design by two external experts and by the two other MOOC teams. In addition, feedback was collected from 55 experts pre-course (open questions in survey) and post-course (focus group sessions) and by MOOC participants by pre- and post-course questionnaire. In the graphic below you can see how this process was designed in the BizMOOC project.

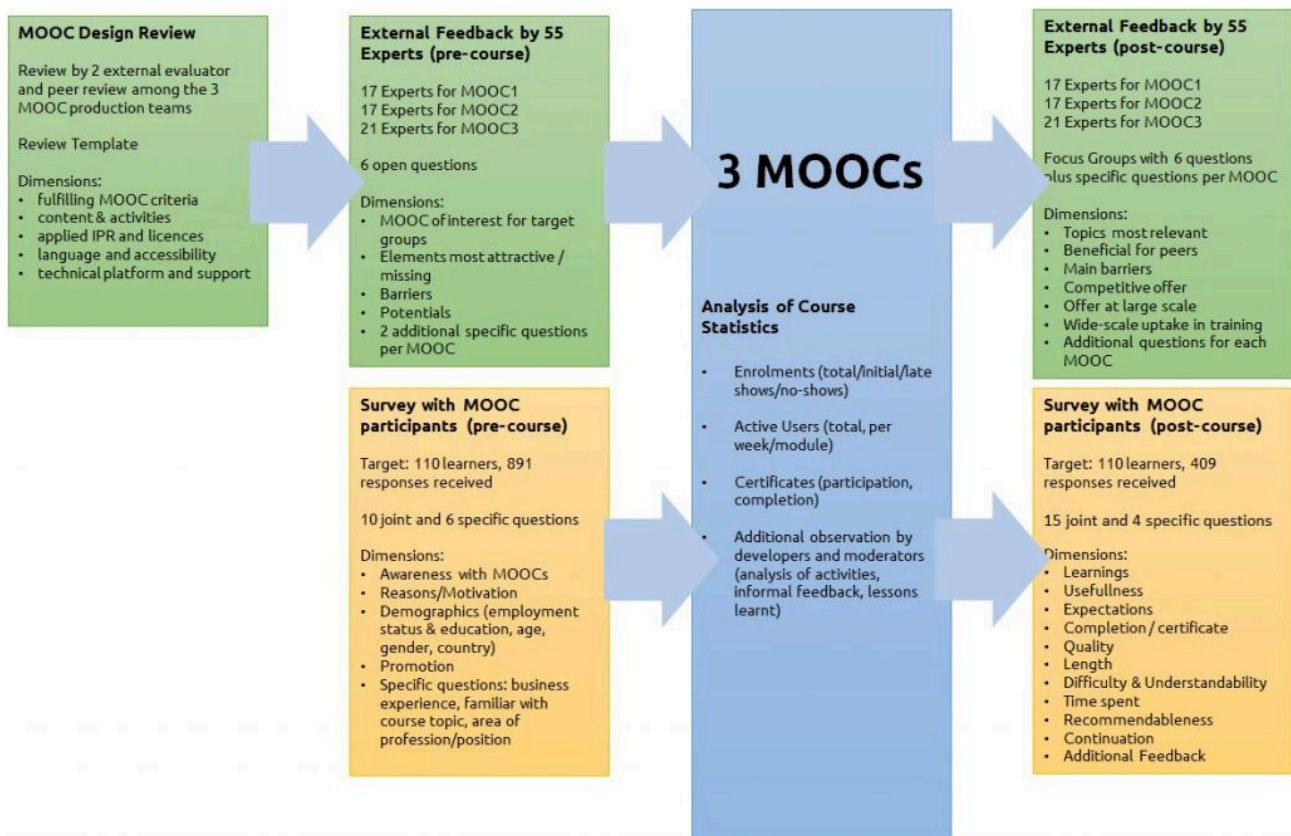


Table 4: Quality Review in BizMOOC

11. MOOC Platforms

Review a range of MOOC platforms and carefully select one to ensure that the chosen platform is accessible for the identified target groups (e.g. can be utilised by businesses or Higher Education Institutions), has the functionality you require for the course and is easy for learners to sign-up to and navigate. Some platforms enable learners to track their progress which can have a strong motivational impact.

12. Make MOOC Content Accessible

Ensure the accessibility of content and assets (such as videos) **on different devices** when developing your MOOC. For example, subtitling videos or providing text that is in a screen reader compatible format or making content accessible on mobile devices.

13. Think About Licensing

Consider the medium- to long-term life of the MOOC. For example, by openly licensing course content and/or by using open education resources (OER) you enable re-use and further development of the course by both yourself or others.

14. Flexible Course Tracks

Whenever necessary, introduce flexible course options (fast track and full track): This functioned well and was appreciated by the learners of our MOOC Pilot 3 on Intrapreneurship. Learners were motivated after completing the fast track (a selective learning pathway of only essential aspects of the course) to go for the full course experience (the whole course). How these different pathways through [course](#) material are referred to is also important: the label “fast track” was appreciated; the label “full track” could be replaced by the term “bonus track” to encourage more learners to consider engaging with more material. To find out more on how this can be done, check out our Intrapreneurship MOOC: <http://mooc.house/bizmooc2018/>.

15. Overview of Deadlines, Certification and Course Tracks

Provide a clear graphic overviews of deadlines, certifications and different pathways through the MOOC. Here are some of our examples from our Intrapreneurship MOOC (images are licensed CC-BY openHPI/Thomas Staubitz).

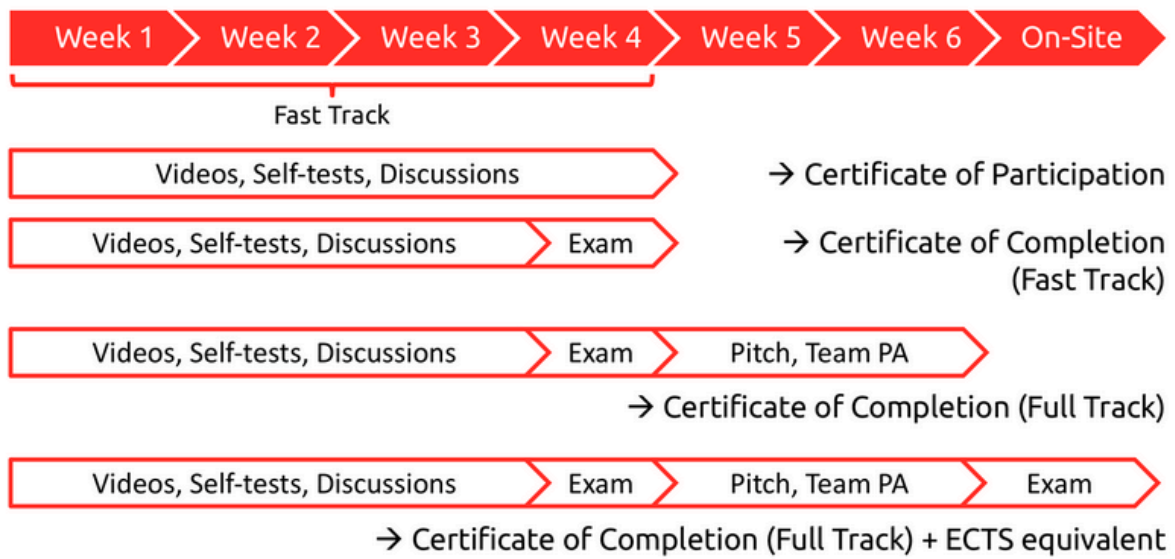


Table 5: Intrapreneurship Course Pathways



Table 6: Overview of Course Positions

16. “E-tivities”

Consider introducing e-tivities as good practice examples for ice-breaking activities: Following the e-tivity model of Gilly Salmon, e-tivities need to have a clear encouraging title, a purpose (objective), a brief and straight-forward summary of the task, a spark (direct link with the topic of the week, interesting title etc.), an individual contribution (share), a dialogue encouragement (interact) and e-moderator interventions throughout the discussion (e.g. stimulate certain discussion by asking counter- or follow-up questions, providing short wrap-ups of discussion points etc.). More detail is available from <http://mooc-book.eu/index/good-practice/> or <https://www.gillysalmon.com/>.

17. Self-Training Options

Introduce self-training options by providing learners with an opportunity to prepare themselves, deepen their learning, be prepared for assessment and other activities, by offering multiple options.

18. MOOC Farewell Party

Consider hosting an online closing event which recaps the most important take-aways and enables learners to reflect informally on their experience. This can be a great way of bringing a sense of closure and shared experience as well as helping to build sustainable learning communities.

19. Encouraging Active Learning

It's important to encourage active learners. This can be done through forum discussions; sharing work; creating shared tools/approaches; encouraging peer support; soliciting regular feedback; fostering community; and through group exercises. Active learning is not only good for learners: the contributed resources and archived materials can be used in future presentations of course materials. See [Chapter 8](#).

20. Ongoing Learning from your MOOC

MOOC and Cloud technologies have influenced approaches to teaching not only in online settings, but also within face-to-face classes and training. Therefore, our last good practice is to outline the vast potential which a smartly designed MOOC with a critical mass of learners holds to improve general teaching and training approaches in professional lifelong learning *and* university & company-training settings.

PART III

FOCUS AREAS

RECOGNITION & ACCREDITATION

The recognition, accreditation and certification of MOOCs may be defined in many different ways, but generally refers to establishing a set of arrangements to make visible and value all learning outcomes (incl. knowledge, skills and competence) against clearly defined and quality-assured standards (Yang, 2016). Proper recognition and accreditation procedures and certification can offer an educational solution for those who are not in a traditional setting, they can constitute an opportunity of virtual mobility or simply provide a chance of re-skilling or up-skilling employees. However, the adequate usage of those processes is yet to become a reality.

Key Issues

A large number of MOOC providers as well as researchers are highlighting the need for a solution for the withdraw/dropout rate of MOOCs. It is acknowledged that dropout rates of this kind of courses are comparatively high (Koutropoulos et al., 2012). A MOOC offered by Coursera in 2012, on Functional Programming Principles in Scala, registered a completion rate of 19.2% (Jordan, 2013). Nevertheless, it must be stated that the majority of MOOCs have completion rates of less than 10% and little is known about the experiences of non-completing MOOC participants (Koutropoulos et al., 2012).

Motivation has been identified as an important contributor to student engagement in a MOOC (Milligan et al., 2013; Milligan et al., 2016). What can motivate people to engage in MOOCs? Individual motivation can go from the desire to achieve an academic credential at a reduced cost, personal enrichment, up to self-satisfaction (Liyaganawardena, Adams and Williams, 2013). It must be underlined that having updated information about the actual motivations in place would be valuable, among others, for the design of MOOCs.

According to Milligan et al. (2016), while high self-regulator students establish specific goals related to the course content, the effect on their professional needs and the structure of their learning around the development of content knowledge and expertise (Pintrich, 1999), low self-regulators focus more on their passion for learning, curiosity, or desire to broaden their knowledge. The range of motivation is reflected by the goals set (Zheng et al., 2015; White et al., 2015). Moreover, high self-regulators are pursuing the extension of their knowledge and expertise to benefit their current or future roles independently if they were intending to complete the course, or if the study process was planned more strategically. On the opposite, low-self regulators are not focusing the learning, but mainly their performance, looking for the completion of the course.

In this case, the recognition of MOOCs and their accreditation could be a more valuable source of motivation than for high self-regulators.

Policy Debates

Together with monetization, recognition/certification is one of the most divisive aspects of MOOC. In fact, the accreditation process opens the door towards an income source at the time it is the way of evaluating the learning process, offering the certification needed/requested by the employers (BIS, 2013). According to Moody's, regarding the foresight of the incomes of north American HEIs, states that MOOCs certificates should be considered as an experiment in the attempt of obtaining extra incomes by granting credits (Moody's Investor Service, 2013).

Usually, educational technology companies like Coursera, edX or Udacity conduct MOOCs. These companies are offering different types of certification for which a fee must be paid. The scale of these fees depends on the type of course. It must be highlighted that certification for a MOOC is offered and recognized by at least one higher education institution. Traditionally learners enrol with one institution and expect to receive the teaching, the content, the assessment and the eventual accreditation from this very same institution (Murray and Friesen, 2011).

Policy-wise, the issue of recognition of digital education has been tackled by international organisations such as UNESCO or OECD that have been emphasising the added value of e-learning methods particularly in its wide social outreach. UNESCO's *Education 2030: Framework For Action* underlines the importance of access to quality basic, vocational and higher education with a clear commitment to lifelong learning strengthened by the usage of ICT tools. Additionally, it reads as follow: In addition, the provision of flexible learning pathways, as well as the recognition, validation and accreditation of the knowledge, skills and competencies acquired through non-formal and informal education, is important (UNESCO, 2015).

When integrating informal learning (open learning) with formal study, one of the major hurdles in this process is the assessment of learning and its accreditation toward a credential (Conrad, 2013; Friesen and Wihak, 2013). Following McGreal et al. (2014), academic assessment is still the privilege and purview of individual post secondary systems. Despite the development of national accreditation frameworks, international ones are still to be developed and adapted to the new needs due to the introduction of each time more informal learning options (e.g., MOOC and other open learning tools).

Practical Options

In the case of non-formal learning there are two basic forms of recognition:

1. **Recognition of Prior Learning (RPL).** Also referred to as Accreditation of Prior and Experiential Learning (APEL), Prior Learning Assessment (PLA, mainly in the USA) and Prior Learning Assessment and Recognition (PLAR, mainly in Canada), among others (McGreal et al., 2014). This is a common approach which involves giving learners credit towards a formal qualification on the basis of evidence of informal learning.
2. **Credit Transfer.** Institutions may mutually recognise credits that students may have gained through formal study and allow them to be transferred from one HEI to another. Complexity results from the fact that there are many different approaches to these credit systems and no one overall approach.

Many MOOC providers recognise their own courses and will allow them to be considered towards a qualification. MOOC learning is typically recognised in the following ways:

- The majority of MOOCs are offering **digital badges** for completion of either the entire course, of each unit or of a week of work (e.g., OLDSMOOC by The Open University, UK);
- Other MOOCs, as the ones facilitated by Coursera, offer proctored exams for a fee, which will involve the earning of a **certificate** for successful students;
- Some MOOCs provide a **Statement of Accomplishment** for successful students, but in this case no college credits are conferred.

Evaluating learning can be a particular challenge when there are thousands of learners on a MOOC. Pundak et al. (2014) suggest the following:

1. Automatic examination of prewritten questions, graded by machine
2. Peer evaluation: learners effectively grade the work of each other
3. Examination through artificial intelligence

The latter of these is perhaps some way off, but arguably is also encapsulated in automatic examination. In future it may be that automatic tutoring systems do the majority of grading work, but we aren't there yet. Consequently a balance should be sought between human and mechanical forms of assessment.

The proliferation of MOOCs included also new challenges and new requirements from the consumers of MOOCs. Among others, the recognition of this type of courses started to be one of the most important issues to be solved by the producers. Universities count with the trust of society in the accreditation process of formal learning. Thus, higher education institutions are needed. Without their involvement, the process is not covering the needs of the consumers. However, academic boards and senates of many universities are often reluctant to reuse open-licensed courses and associated assessments even though a.) those materials have been formally approved by another accredited university; and b.) these open courses can be adapted locally at no cost and offered in parallel with existing courses in order to diversify curriculum at the home institution.

INTELLECTUAL PROPERTY & COPYRIGHT

It is characteristic of MOOCs to offer free access to the complete course offering for all participants. However the materials are to be read, used and even reused up to a certain extent (Wahid et al., 2015). Such practices have direct implications concerning Intellectual Property Rights (IPR) and copyright.

When developing a MOOC there are two main IPR concerns that must be taken into account beforehand. The first one is choosing what information, lessons and materials will be included within the MOOC and what are the rights that the MOOC's promoter has over them. The second is to decide under what terms will the materials be shared to users.

As per the selection of contents and the rights over them it should be taken into account that Berne Convention, to which United States and EU countries are members, states that copyright will protect, from the moment of its creation and without the need of registration "every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression" (<https://www.law.cornell.edu/treaties/berne/2.html>).

Thus, any extract from books or websites, photos or videos used in the MOOC is protected by copyright by default. Consequently, it is very important for the promoters to assess if they are entitled to use third parties' content that are planning to include in the MOOC (copyright clearance). It is also relevant to define the terms of the license and/or transfer of rights over the content created by third parties and in-house staff.

As per the creation of contents and the use of third parties content it is important to get the consent of the authors by means of a license or general terms and to ensure that such consent covers the different uses of the works in the MOOC. The deliverance of materials to users also has copyright implications, mainly related to the authorised uses (i.e. to read, to copy, to readapt, to repurpose etc.), which are usually included within copyright clauses on the general terms and conditions of the course.

Platforms

The implementation and running of a MOOC needs not only to create the structure, methodology and content for the course, but also digital platform that supports the delivery of lessons, exercises and activities.

The alternatives for the universities are to create their own platform or to provide their MOOCs through already existing platforms. The second alternative is the most popular one since it is

cheaper, more flexible and allows benefiting from the level of recognition of already existing MOOC platforms.

Generally the platform is selected depending on the goal of the courses. Additionally, the methodology and the distribution model of both university and host content provider should be taken into consideration when selecting the platform.

The platform provider acts in these cases as a hosting provider. Such position entails certain legal concerns that are going to be exposed in brief. First, it is important to define properly what are the rights and obligations of the platform provider, including the degree of control and access to the content, and to define them clearly in a hosting agreement. Hence, the following issues should be considered before signing an agreement with a content hosting provider:

- Content Ownership and Use;
- Content Placement;
- Content Selection, Modification and Removal;
- Attribution and Branding;
- Flexibility.

Whichever platforms are used, it will be important to comply with relevant laws and regulations around IPR and copyright.

Copyright

Copyright is a law that gives the owner of a work (like a book, movie, picture, song or website) the right to say how other people can use it. Copyright laws make it easier for authors to make money by selling their works. It is one part of a group of laws about intellectual property (the others being trademark and patent law).

With copyright, a work can only be copied if the owner gives permission. If someone copies a work without permission, the owner can say they infringed their copyright. When this happens, the owner may sue for the amount that should have been paid.

Copyright was originally made for books. Before printing presses were made, books could only be copied by hand, which would take a while to do. But when printing presses were made, books could be copied faster and easier. Because of this, some books were copied by people who did not own the book themselves. So lawmakers gave owners the right to copy. Because technology got better over time, copyright began to cover other things people could make like pictures, sound, and film. In most countries, authors automatically own the copyright to any work they make or create, as long as they do not give the copyright to someone else.

Some people argue that copyright laws make it easier for people to make new works and think of new ideas. After all, if authors get to make money for the time, effort and money they put in, then they will want to make more works later, and make more money. But others believe that copyright laws make it harder to be creative. Without copyright, other people could reuse existing work, and copyright law often stops that.

Fair Use

Copyright over a work cannot be understood as an absolute right. Since the very

beginning copyright related treaties such as Berne Convention (http://www.wipo.int/treaties/en/text.jsp?file_id=283698#P85_10661), the Agreement on Trade-Related Aspects of Intellectual Property Rights (https://www.wto.org/english/tratop_e/trips_e/trips_e.htm) or WIPO Copyright Treaty (<https://wipolex.wipo.int/en/text/295157>) among others, have provided for the possibility for members to establish a series of limitations and exceptions over copyright. Whereas limitations are referred to subject matter that does not require copyright protection (e.g. legislative texts), exceptions are based in the nature of the use (e.g. quotation of a fragment). Both limitations and exceptions may be subject to certain requirements.

MOOCs introduce certain differences to traditional means of classroom-based teaching, which should make us to be reluctant or at least careful when deciding whether or not using third parties' protected works. Some of these differences rely on the nature of the MOOC itself, such as being profit or not profit or the (larger) potential number of users. Others strongly depend on how the content is used (e.g. for mere decorative purposes) and how is delivered to users (e.g. only during the presentation).

It is worth noting that the exceptions to copyright in the US fair use doctrine substantially differ from the teaching exception in the EU. In general is not advisable to rely in the compatibility of these exceptions without a case-by-case assessment.

Open Licences

There are different types of copyleft or "open" licenses according to the different permissions expressed. . Creative Commons offer a flexible system of licences that allows copyright holders to offer general license under one or more of the following conditions:

- BY- Attribution: any third party using the work must credit the author.
- ND- Non- Derivative: derivative works (i.e. modified, improved or translated versions) are not authorised.
- SA- ShareAlike: any derivative work must be shared under the same conditions of the original work.
- NC- Non- Commercial: the work cannot be used for commercial purposes.

These conditions could be mixed into different types of Creative Commons Licenses (see table below).

CC Licenses	Terms and conditions
CC BY	Attribution
CC BY-SA	Attribution-ShareAlike
CC BY-ND	Attribution-NoDerivatives
CC BY-NC	Attribution-NonCommercial
CC BY-NC-SA	Attribution-NonCommercial-ShareAlike
CC BY-NC-ND	Attribution-NonCommercial-NoDerivatives

Table 7. Open Licence terms and conditions. Source: Creative Commons

Public Domain

The “Public Domain” is composed by every work whose copyright term has expired. There are a number of considerations that should be taken into account when using public domain works:

- The term of protection for copyright works may differ from country to country. As a general rule, the term of duration is, at least, the life of the author plus fifty years, according to Berne Convention. However the term in US and Europe tends to be longer (usually the life of the author plus seventy years).
- Second, it must be noted that works within Public Domain may still be subject to copyright in certain cases (e.g. a translation of a work in the public domain is a derivative work that enjoys copyright protection) or to other related rights (e.g. a 2020 concert that includes a Vivaldi musical piece played by the London Philharmonic Orchestra is subject to their performance rights, even when Vivaldi’s works as a composer have become Public Domain).
- Finally, it is strongly advisable to credit the author. In United States crediting the author of a work in the public domain is optional and even a matter of etiquette. On the other side, in continental Europe the right to the recognition of the works’ authorship is closely linked to the “paternity” of the work and is perpetual (i.e. does not expire).

Open Content

Another possibility is to use third parties’ works that have been delivered under Open Content terms or a general- copyleft or open licence. According to the David Wiley’s definition of Open Content⁵ it describes any work that grants users a perpetual authorization to:

1. Retain – the right to make, own, and control copies of the content (e.g., download, duplicate, store, and manage)
2. Reuse – the right to use the content in a wide range of ways (e.g., in a class, in a study group, on a website, in a video)
3. Revise – the right to adapt, adjust, modify, or alter the content itself (e.g., translate the content into another language)
4. Remix – the right to combine the original or revised content with other material to create something new (e.g., incorporate the content into a mashup)
5. Redistribute – the right to share copies of the original content, your revisions, or your remixes with others (e.g., give a copy of the content to a friend)

On the other hand, the term “copyleft” comprises a number of general licenses that allow the use of the protected works under certain conditions without the need of an individual authorization. In other words, every user that fulfils the terms defined in the general license is automatically granted a license over the content.

Creating and Developing Content

In recent years, OER have experienced a boost and stakeholders and policy makers have highlighted their importance. The UNESCO (2011) adopted definition of Open Educational Resources is “(...)

teaching, learning and research materials in any medium that reside in the public domain and have been released under an open licence that permits access, use, repurposing, reuse and redistribution by others with no or limited restrictions (...)” this definition was based on Hewlett Foundation definition (Atkins et al, 2007).

The main advantages associated to open models is a higher level of replicability and visibility, that lead to higher levels of engagement of the users with the update and adaptation of materials “People will often volunteer to do things you could never pay them enough money to do” (Wiley, 2007). In addition, contributions of users encourage the adaptation of the course to the most relevant areas of the topic, making the MOOC a true demand-driven service.

MOOC BUSINESS MODELS

While Massive Open Online Courses (MOOCs) offer a complete course experience free of charge by definition, there are monetary cost and benefit 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 their players makes it thus difficult to analyse a universal business model for MOOCs. Also, the growing influence of MOOCs attracts new stakeholders in the market, bringing in new services, sponsorships, customers, cross-financing models etc.

Although some providers are slowly changing this policy, many Massive Open Online Courses (MOOCs) are still offered completely for free online. The participants do not have to pay anything for a full course experience: all the resources and most of the course services (e.g. feedback, tests, quizzes, exam and some limited tutoring) are offered free of charge. But who is paying for the efforts in developing MOOCs and for all the operational costs?

Are MOOC Sustainable?

To answer that question we need to look at possible business models describing the conceptual structure that supports the viability of a business (i.e. how an organisation fulfils its purpose including all business processes and policies). Business models can apply to any type of organisation including one at the governmental level (see for example chapter 8 of UNESCO-CO, 2016). For a long time, one of the main challenges in the area of MOOCs was to develop sustainable business models and to some extent it still is.

However, creating and analysing a general or 'universal' business model for MOOCs is difficult, if not impossible. This is mainly due to the fact that several stakeholders are involved in the creation and the distribution of a course, as well as research and further services beyond the MOOC itself. The content of a course might come from a university, a company, a non-profit organisation or other parties. When it comes to the distribution, there are platforms that use content from external partners and generate revenue from issuing certification or additional services. Other platforms are either part of a higher education institution that provides the content or are funded by a third party. Thus, the conceptual differences of these various content providers, platforms and other stakeholders make it difficult to establish a universal MOOC-model. Therefore, we will first define our understanding of the roles of these stakeholders.

Role	Description	Actor
Content provider	Provides the course content (slides, videos, quizzes, exams, reading material). This can be one party, or it can be split up between several parties. E.g. one party could produce the slides while another party records the videos, or one party produces week 1, while the other party produces week 2, etc.	Universities, enterprises, Commercial content agencies, NGOs, governmental institutions, associations
Platform provider	Hosts and operates the MMS. Provides the possibility to conduct courses either as a self-service product or with full support.	Commercial companies, universities, platform developers, non-profit organisations, enterprises, governmental institutions
Platform provider	Hosts and operates the MMS. Provides the possibility to conduct courses either as a self-service product or with full support.	Commercial companies, universities, platform developers, non-profit organisations, enterprises, governmental institutions
Certification provider	Some MOOCs offer more than the mostly rather informal MOOC certification. Examples are e.g. ECTS credits or professional certification.	Universities, enterprises, commercial companies, governmental institutions, associations

Table 8: Possible roles of stakeholders in MOOCs

Often different roles are taken by the same actors. Depending on the current role, the actor might have different interests. We will now give a few examples to make these distinctions more tangible.

Business Model Concepts

The ‘business model’ concept is a theoretical model being used in science and the business-context. Especially, the use of word ‘business’ appears to be confusing: although the concept was developed in the context of for-profit businesses, it is now applied to any type of organisation, including for-profit, non-profit, governmental or any other type of organisation. In addition, there are many versions of business models. Al-Debei (2008) identified four primary dimensions: (1) Value Proposition, (2) Value Network, (3) Value Architecture, and (4) Value Finance while Yoram (2014) comprised the following three components: (1) Customer Value Proposition; (2) Infrastructure (both resources and processes) and (3) Financial Aspects.

However, the economic models cannot be applied to open content and free resources like Open Educational Resources (OERs) and some parts of MOOCs (Stancey, 2015). Stancey argues that the classic economy is based on scarcity while OERs and MOOCs are based on abundance at no cost. Thus, completely different approaches might be needed.

With the aim to either develop a new one or document existing business models, many frameworks and templates are used. The most popular one used nowadays is the Business Model Canvas (Fiel, 2013). The Business Model Canvas was initially proposed by Osterwalder (2010) based on his earlier work on Business Model Ontology (Osterwalder, 2004). Since then, new canvases for specific niche markets have appeared, such as the Lean Canvas (<https://leanstack.com/leancanvas>) and Open Business Model Canvas (<https://medium.com/made-with-creative-commons/what-is-an-open-business-model-and-how-can-you-generate-revenue-5854d2659b15>). In addition, the latter includes ‘Social Good’ and ‘CC licence’ (<https://docs.google.com/drawings/d/1QOIda2qak7wZSSOa4Wv6qVMO77IwkKHN7CYyq0wHivs/edit>) while the Lean Canvas is especially in the interests of the start-ups (<https://canvanizer.com/how-to-use/business-model-canvas-vs-lean-canvas>).

The components of the canvas are:

- **Value Propositions:** A promise of value to be delivered and acknowledged and a belief of the customer that value will be delivered and experienced. A value proposition can apply to an entire organisation, parts thereof, customer accounts, or products or services.
- **Customer Segments:** What group(s) of customers is/are a company targeting with its product or service by applying filters such as age, gender, interests and spending habits.
- **Channels:** What channels does a company use to acquire, retain and continuously develop its customers.
- **Customer Relationships:** How does a company plan to build relationships with the customers it is serving.
- **Revenue Streams:** How is a company pulling all of the above elements together to create multiple revenue streams and generate continuous cash flow.
- **Key Activities:** The most important activities in executing a company's value proposition.
- **Key Resources:** The resources that are necessary to create value for the customers. These resources could be human, financial, physical and intellectual.
- **Key Partnerships:** What strategic and cooperative partnerships does a company form to increase the scalability and efficiency of its business.
- **Costs:** What are the costs associated with each of the above elements and which components can be leveraged to reduce cost.

Unbundling

Universities typically offer a bundle package including a range of services such as teaching, assessment, accreditation and student facilities 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 specialised institutions and providers. Regular examples are support of the study choice process, study advice and tutoring, content creation and development, examination training, assessment and proctoring, learning platforms, learning analytics services, etc.

As such, different educational services are split amongst different funding schemes and even different customer segments. Some (educational) services are outsourced to third parties for concerns such as cost efficiency or organisational priorities. As such, different educational services are unbundled. Freemium business models depend on the money that is generated from additional services to be paid for next to the basic product – service offered for free.

MOOCs are seen as an accelerator of these unbundling processes by outsourcing the marketing efforts, ICT/delivery platform, exams, learning analytics services, etc. Consequently, the business model of MOOCs (and education more generally) will change as well.

Despite the fact that Massive Open Online Courses (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 to apply a universal business model to MOOCs. Currently, a successful and financially sustainable business model of MOOC has yet to be developed. Since MOOCs are free of charge, services around MOOCs and additional values (e.g. certification) are offered in order to create revenue. The whole cost-revenue cycle is even more complex since most content providers cross-finance their costs and many MOOC platforms receive external funding for their activities. The rapid growth in the MOOC market leads to the influx of new stakeholders, bringing in new services, sponsorships, customers, cross-financing models etc. in the whole world of MOOCs.

DEVELOPING HUMAN RESOURCES

Knowledge can be seen as a key success factor for any company. Internet technologies have brought many possibilities for easing the transfer of know-how and made it possible to access knowledge anywhere and at any time. MOOCs are in essence a restatement of online learning environments that have been in use for some time. What is new is the numbers of participants, being asynchronous, and the fact that the format concentrates on short form videos, automated or peer/self- assessment, case studies, problem-based scenarios, forums and ultimately open content from a representation of the world's leading HEIs.

Which Companies use MOOCs?

Some companies have already realised the potential of MOOCs as they can be applied in various forms in the daily business routine. Some businesses engage in the creation of MOOCs and utilise these MOOCs for staff training and development, others do not engage actively in the MOOC production, nevertheless they allow their employees to participate in these courses and in return, the employees get reimbursed. On the other hand, Small and Medium Sized Enterprises (SMEs) in particular often do not have expertise in HRD or they lack the infrastructure and resources needed in order to conduct successful and effective staff training (Hill and Stewart, 2000). In this respect, it is assumed that all types of companies can profit by the application of MOOCs and indeed, more and more companies are implementing and utilising MOOCs for various purposes. Examples from the MOOC providing platform Iversity include large corporations like L'Oréal, Deutsche Bahn, Hermes, Variant, but also medium-sized companies like Dräxlmaier, Baur Versand and many more (Iversity, 2015a). Some platforms for example a PRO version of courses, a for-pay offer specially tailored for the professional needs and staff development with a smaller amount of participants (Iversity, 2015a). Also the platform mooc.house from openhpi is offering a wide range of business-related courses which find applicability within the corporate context (openhpi, 2017).

Some businesses also produce MOOCs in cooperation with universities and offer these MOOCs afterwards on the aforementioned platforms. The accountancy firm KPMG for example produces MOOCs that can be accessed on the Iversity platform (Iversity, 2015b). The American business consultancy company McKinsey is engaging in the production of MOOCs as well; they are collaborating with the open platform edX (Lapal, 2015). Moreover, the British retail company Marks & Spencer is producing MOOCs in collaboration with the University of Leeds, and they provide their MOOCs on the platform FutureLearn (Coughlan, 2014). The platform FutureLearn has further

collaborations with partners like BBC or the UK Government and they also work with ‘professional bodies such as the Association of Chartered Certified Accountants and Institution of Engineering and Technology’ (FutureLearn, 2016). Businesses like IBM, National Geographic or the World Bank Group are cooperating with Coursera (Coursera, 2016).

Accrediting Learning

Accreditation of certificates received by institutions offering MOOCs has to take place alongside other legal negotiations such as additional contracts between the binding entities. In order to adequately accept and integrate certificates into the internal education history of a company, several steps have to be taken. For example, the costs involved in taking a MOOC e.g. for the issuing of certificates etc. needs to be taken into consideration. Many big corporation have their own internal buying software, e.g. SAP etc. with specific procurement processes in place. Allowing employees to participate in external courses often means a substantial increase in bureaucracy.

Screening the curriculum and comparing it to similar education programs can be seen as a first step. Not all of the content provided in a MOOC may be adequate for internal training needs. Moreover, since company specific topics will probably not be included in the MOOC’s curriculum, missing or additional topics or courses may be highlighted or named within the internal learning path for a certain skill or necessary training program.

Furthermore, a conversion of the workload has to take place. Since parts of a MOOC may take place outside of standard working hours, the amount of hours that may be required for a certificate needs to be converted. Additionally, an agreement with working hours, taking place on evenings and weekends, needs to be achieved. Here the decision may vary due to country and company specific laws and regulations. Finally, the outcome, (the achieved skills set or capability) has to be aligned with global development policies and therefore integrated into internal career programs. Since technology-oriented corporations tend to have a very specific focus towards technical skills, the conversion of skills acquired by MOOCs might become very complex.

The learning environment has to support the learning process by allowing learners to test new competences and by confronting them with graphical representations of their progress. Assessment tools need to be user-friendly and interactive in a way to engage and motivate learners. The synthetic representation of learning progress must be easily accessible from any part of the platform. Learners should be able to annotate the content with personal notes, only available to them, and with shared notes and comments that trigger reactions from the teaching team and discussions in the learning community. In this respect, a certain equilibrium of individual learning and interaction is necessary in order to improve the learning success.

Promoting (Human) Development

One of the often mentioned drawbacks of MOOCs is the limited interaction between the course participants. This lack of interactivity might not be a big problem for private users, but from a company’s perspective this interaction might be one crucial factor for the learning success as with this interaction the contents are reviewed and repeated. In order to create a supportive community, a professional trainer / team of experts should guide and supervise the discussions and answer any questions that might arise regarding the content. In this respect, the trainer team should have the possibility to question the content and trigger questions in order to revive the discussions.

However, it needs to be taken into consideration that many learners are less comfortable when taking part anonymously in large groups and prefer the intimacy of small groups, eventually defined by similar characteristics like age, location, or interests. The platform should allow learners to find like-minded learners, and to define protected spaces for groups to organize a collaborative learning experience.

It is also important that the trainer team supports the learning community in this way, that there are no inhibitions as some learners might have the fear of posting questions in a forum as they don't want to show deficiencies in their knowledge in front of the community. This point is especially important when it is visible who is posting questions and depends on the design of the forum.

In HRD MOOCs are used to maximize global organization training and are building a variety of MOOC learning solutions for the employees' professional development as the average annual expenditure per employee is increasing. The reasons for committing to trainings vary: improving product quality, introducing technology to gain operational efficiency and reducing errors. For HR it is important to analyse the effectiveness of the trainings to identify benefits that have in addition increased the operational effectiveness. In order to provide a holistic view of the training a return on investment performance analysis on the employees who attended the training has to be conducted.

HR works closely with management of all levels in order to define how valuable trainings were relevant to the effectiveness of their organization. For example, when accidents in manufacturing facilities are reduced because employees get trained in safety at work, it may also be possible to quantify the amount of time quality assurance representatives spend in reworking products prior to shipment to customers. Tracking all this may also relieve the budgeting process as for instance, based on an approved record of training cost per employee, HR can evaluate the expenses for the training of new employees. In addition, comparing the training cost per employee with similar organizations, the data can be helpful for HR to justify training initiatives for their organization. Developing the skills of a company's own manpower is an important way to enhance the competitive ability in the market (Esen and Collison, 2005).

How Much Does It Cost?

Regarding the State of the Industry Report (ASTD) in 2012, companies have spent about \$ 1,200 per employee on training annually. Companies can amortize investments in course content development and potentially save costs related to a company's training. An increased interest in MOOCs is caused by the stagnant economy considering the high cost of achieving college degrees to be in demand for today's job market. MOOCs provide positive effects for training through partnerships with companies such as Udacity and Coursera. There are various reasons why this model could make sense for companies today. Some of the most attractive features of MOOCs are their combination of autonomous learning and online collaboration with colleagues and lecturers, so developing an effective MOOC for corporations should be done in the same way as any other HRD intervention.

An important first step for developing a MOOC for an organization is to ascertain a needs assessment or analysis to determine which manpower skill-gaps should be addressed. Corporations are flexible in developing a MOOC for their own purposes or using free MOOCs offered at distinguished universities. Nevertheless, MOOCs could be a significant aspect of an employee's development plan – and also for cost reduction – instead of sending the employee to several conferences. Some organizations, like Yahoo, collaborate with Coursera to provide

employees with access to MOOCs for various topics such as Cryptography, Java and so on. After completion of a MOOC they receive a certificate of completion. This certificate strengthens the motivation that the organization deems to be important for productivity.

However, MOOCs still face some challenges regarding the design of the courses and some questions still need to be addressed, such as whether MOOCs could replace traditional education and training in all of its facets of personal development. Another big challenge is also present from the employee's side. Many employees are still sceptical concerning e-learning and prefer the personal contact in traditional trainings. Once the employees are convinced that e-learning can indeed have benefits for them, that it can improve the learning environment in general and increase the compatibility of further education with social needs, the learners will accept online learning and will be more satisfied with this new training method (Lee et al., 2012, p. 404).

Vision

Moreover, organizations have changed their way of thinking towards providing their employees training. Corporations focus on employee development opportunities that act immediately on the employee's performance. MOOCs are therefore perfect since employers put the career development in the hands of the employees. Hence employers can order development requirements as conditions of employment and allocate time during the month or year for professional development. The implementation of MOOCs in multinational corporations has many benefits to HRD as they can be considered a tool that assists HR in developing multinational learning communities. This can be challenging for those who organize these learning environments. Today it's important to collaborate with others and learn in a diverse workplace – this is an important aspect of professional development. Employees who cannot collaborate with others from diverse cultures and backgrounds fall behind employees who do not have this ability as this often means the difference between success and failure in business (Slotte and Tynjälä, 2005).

Online education does not constitute a threat to company revenues or branding. Using MOOCs for employee development provides enormous benefits including accessibility, affordability and specific training. The specific training allows collaborations to develop employees' skills and possibly gain competitive edge. Moreover, companies need every tool to grow in a competitive global marketplace because the threat of lacking behind is all around.

FOSTERING INNOVATION AND CREATIVITY

There are various factors for the exponentially increasing popularity of MOOCs. Some of the most important ones are the format and pedagogical base (Bersin, J., 2013, Lackner&Kopp, 2014, Shah, D., 2014) which consider MOOCs to be very suitable for teaching and learning of concepts, methods and theories, for obtaining practical skills and competences and last but not least, for boosting the sense of innovation and the creativity of the educational process participants. Moreover, MOOCs offer a diverse community of participants the opportunity to share ideas and get deeply involved in the subject via a rich variety of synchronous and asynchronous online activities.

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 not only for students, but also for all life-long learners and modern professionals striving for on-going career development and personal improvement. MOOCs have always been a great format to exchange ideas among participants, to study and develop creative processes and foster innovation. This is due to several factors, including the fact that participants in Massive Open Online Courses are usually very diverse. The fact that these courses are provided for free or at low prices (which is their other big advantage) enables both people with no formal education and those with a degree from a higher education institution to be able to embrace the opportunities (Green S. 2015).

Unlike the traditional classroom setting at a university, participants from all over the world, at any age and with different interests, abilities and backgrounds can enrol in an online course. Furthermore, studying in a MOOC is a combination of synchronous and asynchronous activities in the online format. This gives participants the ability to receive input from the teacher in the course, reflect on the topic at different places and times and interact with the course community subsequently. Depending on the pedagogical design of the online course and the platform features, one can substantially increase participants' innovation and creative outputs by simply enabling them to unleash their creative potential.

MOOCs centred around creativity and innovation live and die with social interaction and activities. Given the developments in both instructional design and platform features fostering peer learning and activities, we expect the quality of these types of MOOCs to improve greatly. Many experts from creative fields were more resistant to offer MOOCs than e.g. experts in the field of computer science or natural science, because they were believed MOOCs could only work for "right and wrong" type courses.

Given the developments in instructional design and technical features we expect more experts from these fields to join the MOOC wave and start offering courses. This will lead to a growing variety of education and professional training options available online through MOOCs to students,

professionals and life-long learners and provide them with a rich range of opportunities to improve their creative and innovative potential and thus their career prospects, professional development and their life as a whole.

To find the right course for one's learning style might not always be easy, but given the rise of rating sites for MOOCs (e.g. Class Central) and the option to just try out different free courses, learners will be able to choose the right courses. One recommendation to end: when trying out a "creative" MOOCs it often makes sense to not just look at some videos, but to take a quick dive into the community and the activities, since these are even more important in this field than in other MOOCs.

ENTREPRENEURSHIP

Entrepreneurship is a wondrous human activity that cuts across all sectors and aspects of human existence. It is a broad and inclusive term, which serves as an umbrella concept for numerous phenomena (Žur, 2014). Whether at individual or company level, academically entrepreneurship is typically associated with opportunity. Opportunity is referred to as the dominant thread in current mainstream entrepreneurship research (Shane, 2000; Venkataram et al., 2012). According to Stevenson & Jarillo (1990), the pursuit of opportunity defines the ability of the individual, as well as that of the organization, to be entrepreneurial. Contemporary coexisting convictions regarding entrepreneurship are rather completing than competing, all referring to the identification, evaluation and pursuit of opportunity (Stevenson & Jarillo, 1990; Jones & Butler, 1992; Shane & Venkataram, 2000).

Entrepreneurship & Business

At individual level, entrepreneurship is defined as the process of new business creation (Timmons, 1985), commonly referred to as start-ups. However, in the last decades entrepreneurship and new venturing has been recognized and supported in numerous other fields of human activity, including social, academic and cultural behaviour.

Company level entrepreneurship encompasses three terms. Entrepreneurial Orientation represents a company's orientation toward entrepreneurship (Dess & Lumpkin, 2005), its culture, HR practices and other ways. It creates the predisposition of a company to act in entrepreneurial ways. Corporate Entrepreneurship (CE) refers to actual entrepreneurial behaviour exhibited by the company itself (Zahra & Kuratko, 1999). Antoncic & Hisrich (2001, p. 23) specify that CE is a "process of creation of new businesses, and other innovative activities, such as development of new products, services, technologies, administrative techniques, strategies and competitive postures." The third term intrapreneurship relates to entrepreneurial behaviour of employees (Pinchot, 1985; Kanter, 1985).

Entrepreneurship in its broad and more popular sense is also conceptualized and perceived as a universal set of skills and attitudes that can be applied in undertakings in every context – new business, company project, social venture or international cultural exhibition (Di-Masi, 2010). Entrepreneurship skills and attitudes are essential at all stages of a professional career and add substantial value to all human activity. All existing conceptualizations of entrepreneurship are

rather completing than competing, all relying on three leading measures: innovation, risk-taking and pro-activeness (Miller, 1983).

Why is Entrepreneurship Important?

In the new century, entrepreneurship has been moving away from traditional management practices towards a more practical, hands-on orientation, better fitting to the extreme uncertain environments in which entrepreneurs operate in. This is reflected in a paradigm shift from comprehensive upfront business planning and traditional accounting methods (though well-approved in established businesses, but not well applicable to start-ups) to more agile and lean business modelling, validation and innovation accounting practices. Most famous representatives are the Business Model Canvas introduced by Osterwalder et al. (2010), the Lean Start-Up approaches by Ries (2011) and Blank (2010, incl. his customer development approach, 2005), the conquest of the Design Thinking methodology in the business domain in the 21st century or new innovation accounting practices such as Moneyball for Start-Ups by McClure (2010). Since then, we observe a new wave of tools and methods especially designed for entrepreneurs and multiple additional canvases and tools have been developed on top of those game-changing approaches. Examples are Ash Maruya's Lean Canvas (2012 [2010]) or Osterwalder et al.'s Value Proposition Canvas (2015), to name but a few.

Interestingly, with the renaissance of corporate entrepreneurship in the era of digitalization and disruptive innovation (in line with Christensen's Innovator's Dilemma, 1997), we see those contemporary entrepreneurship approaches increasingly being converted back to traditional management of established businesses of all sizes, which are trying to stay innovative and alive by adapting modern start-up approaches for their own management. Ries for example adapted his Lean Start-Up Approach for companies and Viki, Toma and Gons (2017) recently introduced an Innovation Ecosystem to support corporates innovating like start-ups without becoming like start-ups.

Educating Entrepreneurs

Entrepreneurship has received immense academic (and non-academic) attention in the last decades (Stevenson & Lundström, 2001). It is an important area of inquiry, especially relevant in times of crisis and economic challenges. Furthermore, the European Union has launched numerous programs aimed at creating and reinforcing the entrepreneurial culture and entrepreneurship education is a fundamental element of its policy. European conceptual frameworks for entrepreneurship education encourage building an "entrepreneurial spirit, development of creativity, initiative and self-confidence." The European Union defines as one of the eight key competences for Lifelong Learning "Sense of initiative and entrepreneurship":

It is the ability to turn ideas into action. It involves creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives. The individual is aware of the context of his/her work and is able to seize opportunities that arise. It is the foundation for acquiring more specific skills and knowledge needed by those establishing or contributing to social or commercial activity. This should include awareness of ethical values and promote good governance (European Parliament and Council, 2006).

Therefore, much effort is put into promoting entrepreneurial behaviour across countries. The

European Commission has stated in their Entrepreneurship 2020 Action Plan that investing in entrepreneurship education is one of the highest return investments Europe can make (European Commission, 2013b). Overall, entrepreneurship education has gained importance and been implemented in the national strategies of most EU member states, given the premise that it may influence the level of entrepreneurial activity in a given country, positively impacts entrepreneurial intentions or positively influences entrepreneurial traits, supports economic growth and creates jobs (Dickson et al. 2008; European Commission, 2013b; Kuratko, 2005). Several authors have highlighted the critical role of entrepreneurship education in developing more and/or better entrepreneurs (e.g. Gorman, Hanlon, & King, 1997; Katz, 2014; Pittaway & Cope, 2007). Elert, Andersson and Wennberg (2015) have shown that entrepreneurship education increases self-confidence, long-term probability of starting a firm, as well as entrepreneurial incomes. Von Graevenitz, Harhoff and Weber (2010) confirmed the positive effects of entrepreneurship education on student's self-assessed entrepreneurial skills and the learning process of their entrepreneurial suitability or aptitude. A survey by Jenner (2012) suggests that 15% to 20% of students who took part in a mini-company program in secondary school will later establish their own business, a percentage which is about three to five times higher than within the general population. Finally, Martin, McNally and Kay (2013) found a significant relation between entrepreneurship education/training (EET) and entrepreneurship-related human capital assets and entrepreneurship outcomes.

In the last twenty years, we have witnessed an immense and dynamic growth of entrepreneurship teaching programs all over the world. Entrepreneurship education has become a standard practice at secondary and higher education institutions in countries around the world (Katz, 2003; Kuratko, 2005). This growth in volume and scope has been coupled by a sharp shift from educating about entrepreneurship to educating for entrepreneurship. Education about entrepreneurship is limited to knowledge transfer. Students learn about starting a business, about legal and business frameworks, what does it mean to be entrepreneurial or how to prepare a business plan. The goal of this type of education is to acquaint students with many aspects of entrepreneurial practice and pursue their understanding of them. However, after many years of this standard approach, we now know that educating about entrepreneurship does not necessarily imply that students become more entrepreneurial nor that they wish to act in entrepreneurial ways (Dickson et al., 2008).

Educating for entrepreneurship is driven by a different goal. It is to develop real-life entrepreneurial skills and behaviours. Some authors go as far as to say that the goal is to change thinking and behavioural patterns (Rae 2005). Rae (2010, p. 595) defines entrepreneurial learning as "led by creativity, informality, curiosity, emotion and its application to personal and real-world problems and opportunities". It is a holistic process, engaging numerous areas of human activity, primarily intellectual and emotional. Wilson, Vyakarnam, Volkmann, Mariotti and Rabuzzi (2009) argue that entrepreneurship education should provide a mix of experiential learning, skills building and mindset shift, ideally starting from the primary level up.

Hence, contemporary education for entrepreneurship includes the promotion and training of personal skills related to entrepreneurship, such as creativity skills, problem-solving skills, communication skills and networking skills. Repeatedly, these features have been identified in the recent past as the goals of entrepreneurial education. A meta-analysis conducted by Mwasalwiba (2010) of top entrepreneurship education programs identifies the following distribution of goals among goals of the education process:

- to enhance attitudes, values, intentions and behaviours – 36%,
- to improve personal skills – 32%,
- to develop opportunity recognition skills – 14%,
- to develop skills necessary for establishing a new business – 9% and
- to acquire general management and organizational skills – 9%.

The analysis of other publications reveals a very clear hierarchy of goals within entrepreneurship education, consistent with the above meta-analysis (Raposo & Paco, 2011). Firstly, all existing conceptualizations include the dominating goal of developing an entrepreneurial drive, spirit and culture among students. In second place comes the goal of generating the ability to recognize and pursue opportunities in various areas, whether business, social and academic. A significant number of authors associate entrepreneurship with the ability to create and operate new companies. Mwasalwiba (2010) notes that scholars in the field of entrepreneurship education are converging towards a single framework of entrepreneurship education. Still, Mwasalwiba (2010) also highlights the lack of shared success indicators and common goal definitions between educators and other stakeholders, when it comes to entrepreneurship education for different target groups.

Online Education for Entrepreneurs

The popularization of entrepreneurship education has accelerated in the last two decades in great part thanks to the new opportunities brought by information technologies. Online learning materials have become abundant and diverse. Online courses facilitate the development of entrepreneurial skills by individuals on their own by means of electronic devices. New technology has made it possible to learn from successful entrepreneurs, share experiences and exchange ideas, as already recognised by Solomon back in 2002 in his statement above. Today, thanks to technology, entrepreneurship education is not only easy to access, but it has become more inspirational than ever. Contemporary authors and educators (Pittaway & Cope, 2007; Rigg & O'Dwyer, 2012) articulate the role of inspiration as a key factor of effective education for entrepreneurship. There are not many disciplines which, like educating for entrepreneurship, require contact with a mentor, a practitioner who can share their success story and experience and provide inspiration for personal life choices. Online teaching resources make that possible.

Massive Open Online Courses (MOOCs) open a new era in entrepreneurship education. Being characterized as flexible, open, self-directed, self-paced, highly interactive including peer learning, interdisciplinary and cost-reducing, MOOC bear a huge potential to cater the needs of future and existing entrepreneurs (Welsh & Dragusin, 2013). In addition, learning data collected provide completely new opportunities (learning analytics) for educators to reflect on and improve their teaching. Mondal, Kumar and Bose (2015) have stated the valuable opportunity of using MOOCs for entrepreneurial education and training especially for developing/emerging countries (in this case India). There, MOOCs can support the provision of high quality education for learners living at far-off places, help re-integrating school-dropouts and motivate learners towards entrepreneurship and starting their own business. As described earlier, this can again stimulate the economic growth, reduce poverty and improve the quality of life of the whole population. Of course, there are also obstacles mentioned such as high drop-out rates, lack of frequent (professor) feedback, cheating, or the difficulty to assess humanities including social sciences online (Welsh & Dragusin, 2013).

However, MOOCs add a modern facet to the diverse spectrum of educational offers in the domain of entrepreneurship and open up access to education to millions of learners world-wide. The newer developments and tools (see chapter 2) are also reflected in the offers of entrepreneurship MOOCs, many of them applying tools such as the business model canvas or Design Thinking in their courses.

Examples of Entrepreneurial MOOC

The existing popular online learning platforms (such as Coursera, edX, Udacity, Openlearning, Openlearn, Futurelearn, iversity, alison, Canvas Network etc.) offer a variety of MOOCs devoted to entrepreneurship, entrepreneurial skills and business start-up. These courses along with others existing on smaller platforms or websites have been analysed in order to identify best practices and most promising models within online entrepreneurship education.

In 2016, several platforms have started to provide specific MOOCs offering transferable college credit to learners who are not enrolled in any of the corresponding university's programs. There are several collaborations between MOOC platforms and universities for the recognition of certificates and award of these kind of credits (such as EdX partnering with Arizona State University, offering full university fresh-level courses) and the number is rising constantly, which also affects digital entrepreneurship education offers (Lequerica, 2016).

In 2017, Georgia Tech and MIT for the first time offered their on-campus students the possibility of earning credits from a MOOC. Students could choose between enrolling in traditional on-campus courses or signing up for the same version available completely online. The results of these two pilots have been promising, MIT students rated the course as significantly less stressful compared to their on-campus classes. For online students, this could improve the credibility of non-credit certificates.

Shah (2018a) also identified several other MOOC trends in 2017. First of all, MOOC providers are still looking for a sustainable revenue model, from free courses, certificates, micro-credentials, university credits, online degrees to corporate training. Second, the number of completely free MOOCs is constantly shrinking, one of the core features that distinguished MOOCs from other forms of online education in the past. Third, MOOC providers have realized that their real audience are not universities and the higher education market but rather the labor market, in particular people who aim at achieving professional and career growth (also called "lifelong career learner"). Fourth, MOOCs have become increasingly flexible and convenient over the past years, adapting to the time constraints of many learners. Fifth, MOOC platforms have successfully entered into the markets for online degrees and corporate learning. Shah (2018b) stated that these two monetization models are what drives the revenue and fast growth of the big MOOC platforms, now and especially in the future. Coursera for example announced almost \$10M in tuition from their online degrees, recently offered the first MOOC-based Bachelor's Degree and has already more than 1000 corporate partners (up from 30 in 2016 and 500 at the end of 2017). This will also heavily effect entrepreneurship education, there are already several online degrees in entrepreneurship available on the several MOOC platforms and corporates are increasingly using MOOCs for training and education of their workforce, such as intrapreneurship courses to foster employee innovation and the creation of ideas within their companies.

Finally, in the context of MOOCs and entrepreneurship education, another trend already mentioned is the rise of micro-credentials over the last two years. According to a report by CTQ and Digital Promise (2016), micro-credentials can be defined as a certification indicating demonstrated competency in a specific skill. Moreover, micro-credentials have four key characteristics:

competency-based, personalized, on-demand and shareable.

Laurie Pickard (2018) recently published an analysis of 450 MOOC-based micro-credentials offered on five MOOC platforms (Coursera, edX, Udacity, FutureLearn and Kadenze). Pickard states that micro-credentials include more than a single course but are less than a full degree and can be seen as a response to the trend of modularity and stackability in higher education, enabling learners to basically create their own education “playlist”. However, Pickard concludes that the current offer of various micro-credentials lacks consistency and standardization, making it difficult to evaluate their significance and compare them, for both learners and employers. It is important to note that the majority of the offered micro-credentials by the 5 platforms is paid, with price ranges from a few hundred to a few thousand dollars. Learners can choose between payment for each course individually or pay upfront for the whole series, receiving a small discount.

Summary

Entrepreneurship courses themselves are a strong current trend in the global MOOC movement (see chapters 5 and 6). Their volume is growing continuously. There is already a competition going on between providers to attract learners which will be reinforced by the great number of entrepreneurship MOOCs and newer formats such as the micro-credentials and full online degrees. The question will be how these offerings differentiate from each other and if the areas of company-level entrepreneurship, intrapreneurship and enlarging/furthering existing entrepreneurial skills will be tackled by MOOCs and follow-up formats. In general, a shift can already be recognized towards self-paced and regularly recurring courses. There are also tendencies to apply the original definition of MOOCs as free courses towards fee-required courses, as more and more content gets locked behind paywalls. As the education sector itself is currently disrupted by entrepreneurship, innovation pressure and digitalization processes, it also has several impacts on entrepreneurship education, such as changing business and revenue models or content delivery channels. Today, the online entrepreneurship education sector is clearly dominated by several American MOOC platforms and content created by American universities and business schools, strongly affecting entrepreneurship education in general on a global level.

The research has identified the main topics of existing online courses devoted to entrepreneurship, which are: start-ups and universal entrepreneurial skills. Compared to the first version of this paper, the number of courses in the area of corporate entrepreneurship has grown, as it clearly responds to the need of fostering entrepreneurial orientation within companies. Even though course topics and contents within entrepreneurship courses are extremely diverse, the focus is now clearly on entrepreneurship FOR entrepreneurs, using innovative tools, such as Business Canvas and Lean Approaches. Such tools have proven to be not only successful and applicable in the area of start-ups but also for corporates looking for constant innovation.

Nevertheless, the analysis has shown that course titles and descriptions not always reflect the actual content of MOOCs (e.g. mixing up idea generation and business modelling or firm-level entrepreneurship, corporate entrepreneurship and intrapreneurship). Many entrepreneurship courses also follow the same structural pattern, such as the development of canvas and a follow-up pitch by learners. This raises the question of whether this actually represents a useful and valuable application of learnings in entrepreneurship courses.

Finally, the concept of failure is missing from the MOOC agenda. Taken that many successful entrepreneurs have failed before, it is surprising that most education systems around the world do not embrace failure. Instead, millions of learners are successfully completing entrepreneurship

courses every year. This might lead potential entrepreneurs to believe that starting a business is simple, requires no big effort and commitment and that success comes naturally. Even worse, failure-free entrepreneurship education can potentially promote the failure of people who are just not suitable for being an entrepreneur. This is important to keep in mind when we analyse the growing volume of online entrepreneurship courses.

LIFELONG LEARNING

Learning to learn constitutes a key competence of life-long learning (LLL) and is a prerequisite to acquisition and improvement of skills and knowledge. It is a main resource of personal development and active citizenship. It is seen as a capacity for all that can eventually foster the development of democracy. To briefly explain its meaning it is about giving ownership to the learner over the activity of learning.

‘Learning to learn’ is the ability to take up and continue learning, to organise one’s own learning individually or collectively with the optimal use of time, information and learning opportunities. This entails the ability to set one’s own aims and objectives, identify the ways, means and obstacles to achieve them according to an individual learning strategy and to monitor and evaluate own learning process effectively.

Lifelong Learning as a Key Competence

This competence means gaining, processing and assimilating new knowledge and skills as well as seeking and making use of guidance. Learning to learn engages learners to build on prior learning and life experiences in order to use and apply knowledge and skills in a variety of contexts: personal, professional and social. Awareness of the ways of enhancing one’s motivation and confidence are crucial to learning to learn.

To enable learner/trainers to function as motivators and facilitators of the learning to learn process of the participants of their educational work, with a view to the development of a positive attitude to learning throughout the life course among those participants (EC, 2006; Hoskins, Fredriksson, 2008).

Generally, education does not only serve the short-term labour market goals, but in order to take ownership over the educational goals (either for the purpose of furthering one’s educational path or for the purpose of upskilling or reskilling), an individual needs to have awareness of the competences, knowledge, skills and qualifications required. Learning to learn requires an individual to know and understand their preferred learning styles at all times to be able to search for the education and training opportunities and guidance and/or support available (EC, 2006; Hoskins, Fredriksson, 2008).

Learning to learn competence requires the acquisition of the basic skills such as literacy, numeracy and ICT skills necessary for further learning. Skills that would enable an individual to access and acquire new knowledge and skills. Those education and training activities imply working specifically on habits and attitudes specific to situations or certain persons, and

on learning practices, such as to concentrate for extended periods and to reflect critically on the purposes and aims of learning. Learners should have the ability to dedicate time to learning individually and independently, but also to work in teams as part of the learning process. As a part of learning to learn competence they should be able to learn how to organise their own learning, evaluate their own progress, and to reach out for advice, information and support when appropriate (EC, 2006; Hoskins, Fredriksson, 2008).

A positive attitude includes the motivation and confidence to pursue and succeed at learning throughout one's life. A problem-solving attitude supports both the learning process itself and an individual's ability to handle obstacles and change. The desire to apply prior learning and life experiences and the curiosity to look for opportunities to learn and apply learning in a variety of life contexts are essential elements of a positive attitude (EC, 2006; Hoskins, Fredriksson, 2008).

Supporting Lifelong Learning Through MOOC

Given the above mentioned, the following elements are recommended to be addressed in the process of developing the MOOC for improving learning to learn competence (Otten, Ohana, 2009):

- Ability to develop a positive attitude to learning among participant;
- Ability to motivate themselves and young people to learn through the life course by demonstrating its necessity and benefits;
- Familiarity with current debates, theories and approaches for helping learners improve their learning practices;
- Familiarity with the political-institutional framework within which the learning to learn of young people can be supported.

Lifelong Learning & Entrepreneurship

The entrepreneurship and intrapreneurship competence constitute an important component of the employability concept. The changes in the labour market and in educational needs demanded a new, more practical approach to skills and competences. Despite the development of this competence, it still remains difficult for learners to become successful in the labour market, proceeding with their personal careers.

However, having gathered and analysed the materials available, including strategical European Union (EU) and European Higher Education Area (EHEA) documents, as well as literature, a detailed definition of this competence was adapted to be used for the purpose of this project. The definition that the authors chose was based on the definition presented in the recommendation of the European Parliament and the Council on key competences for lifelong learning (EC, 2006) complemented by findings from other sources, as well as own experience of the authors.

Sense of entrepreneurship refers to an individual's ability to generate new ideas and turn them into action. It includes innovation, risk-taking, and the ability to establish, launch and manage projects in order to achieve planned objectives. This supports individuals, not only in their everyday personal and professional lives and ability to use opportunities, and constitutes a basis for more specific skills and knowledge needed by those establishing or contributing to social development

and economic activity. This should include awareness of ethical values and promote good governance (EC, 2006; QAA, 2012).

Essential knowledge embraces the ability to define opportunities available for personal and professional activities that would fit in a broader socio-economic context that societies live in, facing all the challenges of developing world with all their implications on educational systems and labour markets. All the learners should get acquainted with the ethical position of enterprises, and how they can they can enter in the role of social entrepreneurs to fulfil not only purely economic needs, but contribute to social sustainable development (EC, 2006; QAA, 2012).

Skills acquired should be linked to proactive project management, effective representation and negotiation, and the ability to work both individually and collaboratively. It is essential to develop the ability to judge and identify one's strengths and weaknesses, and to assess and take risks (EC, 2006; QAA, 2012). Learners that have acquired entrepreneurship and intrapreneurship can be described as having a proactive, independent and innovative approach in personal, professional and social life. It entails motivation and determination in striving for fulfilment of the objectives, both in personal and professional dimension (EC, 2006; QAA, 2012).

Key Considerations

Given the above, the following elements are recommended to be addressed in the process of developing the MOOC for the purpose of improving learning to learn competence (Otten & Ohana, 2009):

- Understanding of quality standards as applied by both funding institutions and employers in the Europe;
- Ability to maintain a non-bureaucratic, flexible and ethical attitude towards the many challenges of work life and long term voluntary engagement in the field;
- Familiarity with the community of practice that forms the professionals and volunteers within European work and capacity / information required for networking within it;
- Willingness to participate in relevant associations and their debates about professionalisation and quality among peers and colleagues at the European level;
- Ability to communicate effectively with clients and funders and to manage projects emanating from a variety of organisational cultures;
- Familiarity with the political-institutional framework within which the debate on quality, professionalisation, qualification and validation within the field of European work takes place.

PART IV

REFERENCES & RESOURCES

BIZMOOC MOOCS

The BizMOOC project piloted 3 Massive Open Online Courses (MOOC) dedicated to relevant business topics and lifelong learning key competences. The courses are free and open for everyone, offered on different platforms and have been produced in interdisciplinary teams between universities and businesses. They are available on an ongoing basis.

Digital Skills, Digital Learning

<http://bizmooc.eu/outcomes/learning-with-moocs-for-professional-development/>

Started 16.10.2017 (self-paced, 4 weeks)

Started 9.4.2018 (self-paced, 4 weeks)

You'll have a chance to reflect on the way you learn, understand how to be a successful MOOC learner, and also find out about the skills you need to be effective in a digital world: from improving what you do online and the way you do it, to finding information, communicating and collaborating with other people.

Availability: Both MOOCs stay available in self-paced mode min. until 2022 (and beyond until further notice).

The whole Course is published under a Creative Commons licence which allows the re-use of material. We advise to check Third Party Content used in the course for their licenses which are published under the course section "Acknowledgement". If you plan to use only excerpts of the course, please contact the Open University UK.

How to Generate Innovative Ideas and Make Them Work

<http://bizmooc.eu/how-to-generate-innovative-ideas-and-how-to-make-them-work/>

1st moderated run: 13.11.17-24.12.2017

2nd moderated run 12.2.2018-31.03.2018

After finishing this course you should be able to:

- understand creativity as a human innate capacity
- stimulate the deployment of your creative potential
- work with a range of different techniques to generate ideas
- apply strategies and techniques for effective problem solving
- learn from failure
- define approaches and criteria for evaluating and selecting ideas

Availability: The MOOC stays available in self-paced mode min. until 2022 (and beyond until further notice).

The whole Course is published under a Creative Commons licence which allows the re-use of material. We advise to check Third Party Content used in the course for their licenses which are published under the course section “Acknowledgement”. If you plan to use only excerpts of the course, please contact the University of Alicante/UniMOOC platform.

Intrapreneurship

<http://bizmooc.eu/intrapreneurship-make-your-business-great-again/>

Started 26.2.2018

Ended 9.4.2018

After finishing this course you should be able to:

- understand the concept of intrapreneurship
- be familiarized with numerous examples of entrepreneurial organizations and intrapreneurship projects
- assess identified opportunities at work, develop your perception of business opportunities at work and convert problems or challenges into opportunities,
- identify stakeholders, target groups and sponsors of intrapreneurial projects,
- enhance understanding and ability to form coalitions around new business ideas,
- develop and deliver a pitch to the various audiences, including board of directors

Availability: The MOOCs stays available in self-paced mode min. until 2022 (and beyond until further notice).

The whole Course is published under a Creative Commons license Attribution-NoDerivatives 4.0 International (CC BY-ND 4.0) which allows the re-use of material. We advise to check Third Party Content used in the course for their licenses. If you plan to use only excerpts of the course, please contact the BizMOOC Project Team.

REFERENCES & FURTHER READING

- Al-Debei, M. M., El-Haddadeh, R., & Avison, D. (2008). Defining the business model in the new world of digital business. In *Proceedings of the Americas Conference on Information Systems (AMCIS)*. pp. 1-11.
- Alario-Hoyos, C., Pérez-Sanagustín, M., Cormier, D., Delgado-Kloos, C. (2014). Proposal for a conceptual framework for educators to describe and design MOOCs. *Journal of Universal Computer Science (JUCS)*, 20(1). pp. 6-23.
- Ananiadou, K. and M. Claro (2009), 21st Century Skills and Competences for New Millennium Learners in OECD Countries. *OECD Education Working Papers*, No. 41, OECD Publishing, Paris. <http://dx.doi.org/10.1787/218525261154>
- Andersen E. (2016). Learning to Learn. *Harvard Business Review*. <https://hbr.org/2016/03/learning-to-learn>
- Antoncic, B. and R. D. Hisrich (2001). Intrapreneurship: Construct Refinement and Cross-Cultural Validation. *Journal of Business Venturing*, Vol. 16, No. 5, pp. 495-527. [doi:10.1016/S0883-9026\(99\)00054-3](https://doi.org/10.1016/S0883-9026(99)00054-3)
- Arbeiterkammer (2016). Betriebliche Ausbildung und Schulung. https://www.arbeiterkammer.at/service/betriebsrat/rechteundpflichtendesbetriebsrates/Betriebliche_Berufsausbildung_und_Schulung.html
- Atkins, D.E., Brown, J.S. & Hammond, A.L. (2007). A Review of the Open Educational Resources (OER) Movement: Achievements, Challenges, and New Opportunities. Hewlett Foundation. <http://www.hewlett.org/uploads/files/ReviewoftheOERMovement.pdf>
- Auernheimer, G., v. Blumenthal, V. and Stübig, H. (1994). Zur Offenheit von Schulsystemen für kulturelle Vielfalt. Gesichtspunkte für einen internationalen Vergleich. In Gogolin, I. (Hrsg.): *Das nationale Selbstverständnis der Bildung*. Münster/New York.
- AVL (2016). AVL GmbH. <http://www.avl.com>
- Azevedo, A. (2012). In colleges' rush to try MOOC's, faculty are not always in the conversation. *The Chronicle of Higher Education*, September 26th. <https://www.chronicle.com/article/In-Colleges-Rush-to-Try/134692>
- Bacsich, P., Nie, M., Jeans, N., Schuwer, R., Karran, T., Witthaus, G. (2013). POERUP Elevator Pitch: 26 Countries in 26 Minutes. <http://www.slideshare.net/witthaus/poerup->

[elevator-pitch](#)

- Banerjee, A.V. & Duflo, E. (2014). Economics Education in the digital age: the implications of online technologies and MOOCs. *American Economic Review* 104(5). pp. 514-518. <https://www.aeaweb.org/articles?id=10.1257/aer.104.5.514>
- Barnaby, G. (2013): Introduction to MOOCs: Avalanche, Illusion or Augmentation? Moscow: UNESCO Institute for Information Technologies in Education. <http://unesdoc.unesco.org/images/0022/002238/223896e.pdf>
- Bates, A. W. (2015). Teaching in a digital age. Guidelines for designing teaching and learning for a digital age. <http://opentextbc.ca/teachinginadigitalage/>
- Baynes, S. & Ross, J. (2014). The pedagogy of the Massive Open Online Course: the UK view. The Higher Education Academy, UK. https://www.heacademy.ac.uk/system/files/hea_edinburgh_mooc_web_240314_1.pdf
- Bell, F. (2010). Network theories for technology-enabled learning and social change: Connectivism and actor network theory. Paper presented at the Seventh International Conference on Networked Learning, Aalborg, Denmark. <http://www.lancs.ac.uk/fss/organisation/netlc/past/nlc2010/abstracts/Creanor.html>
- Bell, K. (2012). MOOC-washing. <https://kevinbell.wordpress.com/2012/07/18/mooc-washing/>
- Bersin, J. (2013) The MOOC Marketplace Takes Off. *Forbes*. <http://www.forbes.com/sites/joshbersin/2013/11/30/the-mooc-marketplace-takes-off/>
- BIS (2013). The maturing of the MOOC: Literature review of massive open online courses and other forms of online distance learning. *BIS Research Paper 130*. http://www.gov.uk/government/uploads/system/uploads/attachemnt_data/file/240193/13-1173-maturing-of-the-mooc.pdf
- BizMOOC (2016). BizMOOC – Knowledge Alliance to enable a European-wide exploitation of the potential of MOOCs for the world of business. EU-Project in the Erasmus+ programme, Key Action 2, Knowledge Alliances, Reference Number 562286-EPP-1-2015-1-AT-EPPKA2-KA.
- Blank, S. (2005). *The Four Steps to the Epiphany: Successful Strategies for Startups That Win*. K & S Ranch.
- Blank, S. G., & Dorf, B. (2012). *The startup owner's manual: The step-by-step guide for building a great company*. Pescadero, California: K & S Ranch.
- Brame C. (2013) Flipping the Classroom. <https://cft.vanderbilt.edu/guides-sub-pages/flipping-the-classroom/>
- Broom, A. (2005). Using qualitative interviews in CAM research: A guide to study design, data collection and data analysis. *Complementary Therapies in Medicine* 13. pp. 65-73.
- Brouns, F., Mota, J., Morgado, L., Jansen, D., Fano, S., Alejandro, S., Moreira, & Teixeira, A. (2014). A networked learning framework for effective MOOC design: The ECO Project approach. In Moreira Teixeira, A. & András Szücs (eds.), *8th EDEN Research Workshop. Challenges for Research into Open & Distance Learning: Doing Things Better: Doing Better Things*. pp.161-171. Budapest: EDEN.

- Brouns, F., Mota, J., Morgado, L., Jansen, D., Fano, S., Silva, A., & Teixeira, A. (2014). A networked learning framework for effective MOOC design: the ECO project approach. In A. M. Teixeira & A. Szücs (eds.), *8th EDEN Research Workshop. Challenges for Research into Open & Distance Learning: Doing Things Better: Doing Better Things*. Oxford, United Kingdom & Budapest, Hungary: EDEN.
- Bryman, A. (1988). *Quantity and Quality in Social Research*. London: Unwin Hyman.
- Bryman, A. (1989). *Research Methods and Organization Studies*. London: Unwin Hyman.
- Bryman, A. (2007). Barriers to Integrating Quantitative and Qualitative Research. *Journal of Mixed Methods Research* 1(8). DOI: 10.1177/2345678906290531.
<http://mmr.sagepub.com/cgi/content/abstract/1/1/8>
- Bundeskanzleramt (2017). Bundesgesetz über den Schutz personenbezogener Daten (Datenschutzgesetz 2000 – DSGVO 2000) / Federal Act concerning the Protection of Personal Data (DSG 2000). https://www.ris.bka.gv.at/Dokumente/ErV/ERV_1999_1_165/ERV_1999_1_165.html
- Butler, B. (2012). Massive open online courses: Legal and policy issues for research libraries. <http://www.arl.org/bm~doc/issuebrief-mooc-22oct12.pdf>
- Camilleri, A.F. and Tannhäuser, A.-C. (2012). *Open learning recognition: Taking open education resources a step further*. Brussels, Belgium: EFQUEL.=
- Castano-Munoz, J., Kalz, M., Kreijns, K., & Punie, Y. (2016). Influence of employer support for professional development on MOOCs enrolment and completion: Results from a cross-course survey. *Proceedings of the European Stakeholder Summit on experiences and best practices in and around MOOCs (EMOOCs 2016)*, p.251.
- Cedefop (2015). *Skill shortages and gaps in European enterprises: striking a balance between vocational education and training and the labour market*. Luxembourg: Publications Office. Cedefop reference series no. 102.
- Christensen, G., Steinmetz, A., Alcorn, B., Bennett, A., Woods, D. & Emanuel, E.J. (2013). The MOOC Phenomenon: Who Takes Massive Open Online Courses and Why? <http://dx.doi.org/10.2139/ssrn.2350964>
- Chuang, I. & Ho, A. (2016). HarvardX and MITx: Four Years of Open Online Courses – Fall 2012-Summer 2016 (December 23, 2016). <http://dx.doi.org/10.2139/ssrn.2889436>
- Clarke, T. (2013). “The advance of the MOOCs (massive open online courses): The impending globalisation of business education?”, *Education + Training*, Vol. 55 Issue: 4/5, pp.403-413, <https://doi.org/10.1108/00400911311326036>
- Class Central (2017). MOOCs categorized by subjects. Based on an open sourced taxonomy for online courses created by Class Central. <https://www.class-central.com/subjects>
- Class Central (2018). By The Numbers: MOOCs in 2017. How has the MOOC space grown this year? Get the facts, figures, and pie charts. <https://www.class-central.com/report/mooc-stats-2017/>
- Clement, M., Ng, A., & Daniel, J. (2013). Coursera under fire in MOOCs licensing row. <http://theconversation.com/coursera-under-fire-in-moocs-licensing-row-15534>
- Commonwealth of Learning (2015). A Policy Brief on MOOCs. <http://oasis.col.org/handle/>

[11599/825](#)

- Conrad, D. (2013). Assessment challenges in open learning: Way-finding, fork in the road, or end of the line? *Open Praxis* 5(1): 1-7. <http://dx.doi.org/10.5944/openpraxis.v5i1.17>
- Conrad, D. and McGreal, R. (2012). Flexible paths to assessment for OER learners: A comparative study. *Journal of Interactive Media in Education* 2012(2). <http://www-jime.open.ac.uk/jime/article/view/2012-12>
- Costello, Brown & Holland (2016) What Questions are MOOCs asking? An Evidence-Based Investigation. In M.Khalil, M. Ebner, M. Kopp, A. Lorenz & M. Kalz (Eds.) *Proceedings of the European Stakeholder Summit on experiences and best practices in and around MOOCs*. pp.211-221. <http://emoocs2016.eu/wp-content/uploads/2016/02/proceedings-emoocs2016.pdf>
- Coughlan, S. (2014) Marks and Spencer moves into online courses. *BBC News*. <http://www.bbc.com/news/education-29206086>
- Coursera. (2016). Partners. *Coursera*. <https://www.coursera.org/about/partner>
- Courtney, K. K. (2013). The MOOC syllabus blues Strategies for MOOCs and syllabus materials. *College & Research Libraries News*, 74(10), pp.514–517. <http://crln.acrl.org/content/74/10/514>
- Crews, K.D. (2014). Copyright and Universities: Legal Compliance or Advancement of Scholarship? (The Growth of Copyright). *IPR Info* (2). IPR University Center, Helsinki. <https://ssrn.com/abstract=2457292>
- Crispin, W. (2012). MOOCs and other ed-tech bubbles. *Edtechnow.net*. <http://edtechnow.net/2012/12/29/moocs-and-other-ed-tech-bubbles/>
- Crosby, P. B. (1979). *Quality is free: The art of making quality certain*. New York, NY: McGraw-Hill.
- Daniel, J. (2012). Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility. *Journal of Interactive Media in Education*, (3). <http://doi.org/10.5334/2012-18>
- Daniel, J., Vázquez Cano, E., Gisbert, M. (2015). The Future of MOOCs: Adaptive Learning or Business Model? *Revista Universidad y Sociedad del Conocimiento / Universities and Knowledge Society Journal*, 12(1). pp.64-74. <http://dx.doi.org/10.7238/rusc.v12i1.2475>.
- de Freitas, S.I., Morgan, J., & Gibson, D. (2015). Will MOOCs transform learning and teaching in higher education? Engagement and course retention in online learning provision. *British Journal of Educational Technology*, 46(3). pp. 455–471 <doi:10.1111/bjet.12268>
- Dillahunt, T. R., Wang, B. Z., & Teasley, S. (2014). Democratizing higher education: Exploring MOOC use among those who cannot afford a formal education. *The International Review of Research in Open and Distributed Learning*, 15(5). <http://www.irrodl.org/index.php/irrodl/article/view/1841>
- DeBoer, J., Ho, A.D., Stump, G. S., & Breslow, L. (2014). Changing ‘Course’ Reconceptualizing Educational Variables for Massive Open Online Courses. *Educational Researcher*, 43(2). pp.74–84. <https://journals.sagepub.com/doi/abs/10.3102/0013189X14523038>

- Deloitte (2016). *Global Human Capital Trends 2016*. <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/HumanCapital/gx-dup-global-human-capital-trends-2016.pdf>
- Department of Business, Innovation & Skills (2013). *The Maturing of the MOOC – literature review of Massive Open Online Courses and other forms of distance learning*. Research Paper no 130. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/240193/13-1173-maturing-of-the-mooc.pdf
- Dess, G.G. & Lumpkin, G.T. (2005). The role of entrepreneurial orientation in stimulating corporate entrepreneurship. *Academy of Management Executive*, 19(1) pp. 147-156. <https://www.jstor.org/stable/4166159>
- Di-Masi, P. (2010). Defining Entrepreneurship: What is Entrepreneurship? Global Development Research Centre. <http://www.gdrc.org/icm/micro/define-micro.html>
- Dickson, P., Solomon, G., Weaver, K.M. (2008). Entrepreneurial selection and success: Does Education matter? *Journal of Small Business and Enterprise Development*, 15. pp. 239-258.
- Downes, S. (2012). Connectivism and Connective Knowledge. Universidad Popular Autónoma del Estado de Puebla. <http://online.upaep.mx/campusvirtual/ebooks/CONNECTIVEKNOWLEDGE.pdf>
- Downes, S. (2013). The quality of massive open online courses. <http://mooc.efquel.org/week-2-the-quality-of-massive-open-online-courses-by-stephen-downes/>.
- Draffan, E.A., Wald, M., Dickens, K., Zimmermann, G., Kelle, S., Miessengerger, K., & Petz, A. (2015). Stepwise Approach to Accessible MOOC Development. In Sik-Lányi, C., Hoogerwerf, E.-J., & Miesenberger, K. (eds.) *Assistive Technology: Building Bridges*. Amsterdam: IOS Press.
- Drucker, P.F. (1985). *Innovation and entrepreneurship*. New York: Harper & Row
- Dumitrescu, V.M. (2015). The Present-Day Trend Towards Massification In Higher Education: The Mooc Model. The 11th International Scientific Conference eLearning and software for Education Bucharest, April 23-24, 10.12753/2066-026X-15-110.
- EADTU. (2016). MOOCs in Europe -Overview of papers representing a collective European response on MOOCs as presented during the HOME conference in Rome November 2015. http://pure.au.dk/portal/files/100669162/MOOCs_in_Europe_November_2015.pdf
- EADTU & ENQA (2017). Peer Learning Activity: The development of blended and online programmes in European higher education Issues of quality assurance (Summary report). http://eadtu.eu/documents/News/2017-PLA_report_24112017_final.pdf
- Elert, N., Andersson, F. W., & Wennberg, K. (2015). The impact of entrepreneurship education in high school on long-term entrepreneurial performance. *Journal of Economic Behavior & Organization* (111). pp.209-223.
- ENISA (2010). Online as soon as it happens (Whitepaper of the European Network and Information Security Agency). <https://www.enisa.europa.eu/publications/archive/>

[onlineasithappens](#)

- Esen, E. & Collison, J. (2005) Society for Human Resource Management. <https://www.shrm.org/research/surveyfindings/documents/employee%20development%20survey%20report%20-%20%20a%20study%20by%20shrm%20and%20catalyst.pdf>.
- European Commission (2006). Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning (2006/962/EC). <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32006H0962>.
- European Commission (2010). Analytical Report Entrepreneurship in the EU and Beyond. European Commission, *Flash Eurobarometer*, No. 283. http://ec.europa.eu/commfrontoffice/publicopinion/flash/fl_283_en.pdf
- European Commission (2012). Council Recommendation on the validation of non-formal and informal learning 2012/0234 (NLE). <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012PC0485&from=en>
- European Commission (2013a). Communication on Opening up Education: Innovative teaching and learning for all through new Technologies and Open Educational Resources. <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0654&from=EN>
- European Commission. (2013b). Entrepreneurship 2020 action plan: reigniting the entrepreneurial spirit in Europe. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52012DC0795>
- European Commission (2018). Addressing the innovation gap: Lessons from the Stairway to Excellence (S2E) project. http://publications.jrc.ec.europa.eu/repository/bitstream/JRC111888/jrc111888_jrc111888_addressing_the_innovation_gap_lessons_from_the_stairway_to_excellence_%28s2e%29_project.pdf
- European Commission, Education and Culture Directorate General (2015). *ECTS Users' Guide*. Luxembourg: Publications Office of the European Union. https://ec.europa.eu/education/ects/users-guide/docs/ects-users-guide_en.pdf
- European Commission/EACEA/Eurydice, (2015). The European Higher Education Area in 2015: Bologna Process Implementation Report. Luxembourg: Publications Office of the European Union. https://eacea.ec.europa.eu/sites/eacea-site/files/european_higher_education_area_bologna_process_implementation_report.pdf
- European Parliament and Council (2006). Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32006H0962>.
- European Recognition Manual (2016). The European Recognition Manual for Higher Education Institutions (2nd ed.). European Students Union. http://www.esu-online.org/asset/News/6001/8220_European-Recognition-Manual-Second-Edition-FIN.pdf
- European Students' Union (ESU) (2013a). Policy paper on quality of higher education (amended). European Students' Union. <http://www.esu-online.org/news/article/6064/Policy-paper-on-quality-of-higher-education/>

- European Students' Union (ESU) (2013b.) Quest for Quality for Students: A Student Quality Concept. European Students' Union. <https://www.esu-online.org/wp-content/uploads/2016/07/quest-report-III-online.pdf>
- European Students' Union (ESU) (2016.) Introduction to ESU's policies in higher education (amended).European Students' Union. <http://www.esu-online.org/news/article/6064/Introduction-to-ESUs-policies-in-higher-education/>
- Fain, P. (2014). Accreditor for Upstarts. *Inside Higher Ed* (May 9). <https://www.insidehighered.com/news/2014/05/09/ideas-take-shape-new-accreditors-aimed-emerging-online-providers>
- Fasihuddin, H.A., Skinner, G.D., Athauda, R.I. (2013). Boosting the Opportunities of Open Learning (MOOCs) through Learning Theories. *Journal on Computing*, 3(3): pp.112-117.
- Fielt, E. (2013). Conceptualising Business Models: Definitions, Frameworks and Classifications. *Journal of Business Models* 1(1). pp.85-105. <https://journals.aau.dk/index.php/IOBM/article/view/706>
- Fischer, H., Dreisiebner, S. Franken, O. Ebner, M. Kopp, M. & Köhler, T. (2014). Revenue vs. Costs of MOOC platforms. Discussion of Business Models for xMOOCProviders, Based on Empirical Findings and Experiences During Implementation of the Project iMoox. In *ICERI2014 Proceedings, 7th International Conference of Education, Research and Innovation, Seville (Spain) 17-19 November*. The International Academy of Technology, Education and Development (IATED). pp. 2991-3000
- Friedl C. (2015). BizMOOC Project Description [unpublished manuscript]
- Friesen, N. and Wihak, C. (2013). From OER to PLAR: Credentialing for open education. *Open Praxis* 5(1). pp.49-58. <http://dx.doi.org/10.5944/openpraxis.5.1.22>
- FutureLearn (2016). About FutureLearn. <https://www.futurelearn.com/about>
- Gaebel, M. (2014). MOOCS Massive Open Online Courses. European University Association. <https://oerknowledgecloud.org/content/moocs-massive-open-online-courses>
- General Secretariat of the Council (2018). Council Recommendation on Key Competences for Lifelong Learning. https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1527150680700&uri=CONSIL:ST_9009_2018_INIT
- Giesche, S. (2010). Interkulturelle Kompetenz als zentraler Erfolgsfaktor im internationalen Projektmanagement. In Steffen, R. (ed.) *Internationale und interkulturelle Projekte erfolgreich umsetzen*. Hamburg: Diplomica Verlag GmbH.
- Gorman, G., Hanlon, D., & King, W. (1997). Some research perspectives on entrepreneurship education, enterprise education and education for small business management: a ten-year literature review. *International Small Business Journal*, 15(3). pp.56-77.
- Green, S. (2015). Pedagogy Of MOOCs And Benefits For Modern Professionals. *Elearning Industry*. <http://elearningindustry.com/pedagogy-of-moocs-benefits-modern-professionals>
- Grodecka, K., & Sliwowski, K. (2014). Open Educational Resources Mythbusting. Open Educational Resources in Europe. <http://mythbusting.oerpolicy.eu/wp-content/uploads/>

[2014/11/OER_Mythbusting.pdf](#)

- Grossman, R. (2013). Are Massive Online Courses in Your Future? Organizational and Employee Development Special Report. Society for Human Resource Management.
- Hanley, L. (2014). After the Massive Open Online Courses: Re/making Humanities in the Era of Cognitive Capitalism. *International Journal of the Humanities: Annual Review*, 12.
- Hansen, J.D. and Reich, J.(2015). Socioeconomic status and MOOC enrollment: enriching demographic information with external datasets. In *Proceedings of the Fifth International Conference on Learning Analytics and Knowledge* (pp. 59-63). Association for Computing Machinery.
- Hardesty, L. (2013). Higher-ed leaders meet to discuss future of online education. MIT News Office. Retrieved from <http://web.mit.edu/newsoffice/2013/edx-summit-0306.html>
- Hattie, John (2008). *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement*. New York: Routledge. ISBN 978-0-415-47618-8.
- Henderikx, P., & Jansen, D. (2018). The Changing Pedagogical Landscape: In search of patterns in policies and practices of new modes of teaching and learning. European Association of Distance Teaching Universities. https://eadtu.eu/documents/Publications/LLL/2018_-_The_Changing_Pedagogical_Landscape.pdf
- Hill, P. (2013). Emerging Student Patterns in MOOCs: A (Revised) Graphical View. <http://mfeldstein.com/emerging-student-patterns-in-moocs-a-revised-graphical-view/>
- Hill, R. and Stewart, J. (2000). Human resource development in small organizations. *Journal of European Industrial Training*, Vol. 24 Issue: 2/3/4. pp.105-117. <https://doi.org/10.1108/03090590010321070>
- Ho, A. D., Chuang, I., Reich, J., Coleman, C., Whitehill, J., Northcutt, C., Petersen, R. (2015). HarvardX and MITx: Two years of open online courses fall 2012 – summer 2014. HarvardX Working Paper No. 10. doi:10.2139/ssrn.2586847
- Hollands, F. M., & Tirthali, D. (2014a). MOOCs: expectations and reality. Center for Benefit-Cost Studies of Education, Teachers College, Columbia University. <https://files.eric.ed.gov/fulltext/ED547237.pdf>
- Hollands, F., & Tirthali, D. (2014b). Why Do Institutions Offer MOOCs? *Online Learning*, 18(3). <http://olj.onlinelearningconsortium.org/index.php/jaln/article/view/464>
- Hollands, F.M., Tirthali, D. (2014c). Research Requirements and Costs of Developing and Delivering MOOCs. *The International Review of Research in Open and Distributed Learning*, 15(5). <http://www.irrodl.org/index.php/irrodl/article/view/1901/3069>
- Hoskins B. & Fredriksson, U. (2008). Learning to Learn: What is it and how can it be measured?, European Commission / Institute for the Protection and Security of the Citizen / Center for Research on Lifelong Learning. <http://publications.jrc.ec.europa.eu/repository/bitstream/JRC46532/learning%20to%20learn%20what%20is%20it%20and%20can%20it%20be%20measured%20final.pdf>
- Hugenholtz, P.B. & Senftleben, M.F.R. (2011). Fair use in Europe. In search of flexibilities. <http://www.ivir.nl/publicaties/download/912>

- IPTS (2016). MOOCs in Europe: Evidence from pilot surveys with universities and MOOC learners. https://ec.europa.eu/jrc/sites/jrcsh/files/IRC%20brief%20MOOCs_JRC101956.pdf
- ITU (2016). Measuring the Information Society Report 2016. International Telecommunication Union. Place des Nations, Geneva.
- Ivanova, M., Holotescu, C., Grosseck, G., & Iapă, C. (2016). Relations between Learning Analytics and Data Privacy in MOOCs. <https://www.scribd.com/document/315193973/Relations-between-Learning-Analytics-and-Data-Privacy-in-MOOCs>
- Iversity. (2015a). One Million Course Enrolments and a Successful Financing Round at iversity. <https://iversity.org/en/pages/one-million-enrollments>
- Iversity (2015b). KPMG und iversity: Online-Kurs zur Zukunft der digitalen Weiterbildung. <https://iversity.org/de/pages/kpmg-corp-digital-learning>
- Jansen, D. , Rosewell, J. & Kear, K. (2016). Quality Frameworks for MOOCs. In Jemni, M., Kinshuk, K. & Koutheair, M. (eds.) *Open Education: from OERs to MOOCs*. Lecture Notes in Educational Technology. Springer.
- Jansen, D., Goes-Daniels, M. (2016) Comparing Institutional MOOC strategies. Status report based on a mapping survey conducted in October – December 2015. EADTU – HOME project.
- Jansen, D., Schuwer, R. (2015). Institutional MOOC strategies in Europe Status report based on a mapping survey conducted in October – December 2014. <https://www.surfspace.nl/media/bijlagen/artikel-1763-22974efd1d43f52aa98e0ba04f14c9f3.pdf>
- Jansen, D., Schuwer, R., Teixeira, A., & Aydin, H. (2015). Comparing MOOC adoption strategies in Europe: Results from the HOME project survey. *International Review of Research in Open and Distributed Learning*, 16(6). pp.116-136. <http://www.irrodl.org/index.php/irrodl/article/view/2154>
- Jenner, C. (2012). Business and education: powerful social innovation partners. *Stanford Social Innovation Review* (August). https://ssir.org/articles/entry/business_and_education_powerful_social_innovation_partners
- Jones, G.R. & Butler, J.E. (1992). Managing internal corporate entrepreneurship: An agency theory perspective. *Journal of Management*, 18(4). pp. 733-749.
- Jordan, K. (2014). Initial trends in enrolment and completion of massive open online courses. *The International Review Of Research In Open And Distributed Learning*, 15(1). <http://www.irrodl.org/index.php/irrodl/article/view/1651>
- Jordan, K. (2015). Massive Open Online Course Completion Rates Revisited: Assessment, Length and Attrition. *International Review of Research in Open and Distributed Learning*, 16(3). pp. 341-358
- Juran, J. (1998). *Juran's quality control handbook* (5th ed.). New York, NY: McGraw-Hill.
- Kalz, M., Kreijns, K., Niellissen, G., Castaño-Muñoz, J., Guasch, T., Espasa, A., Floratos, N., Tovar, E., & Cabedo, R. (2014). MOOCKnowledge: Establishing a large-scale data collection about participants of European Open Online Courses. In D. Jansen, & A. Teixeira (Eds.). *Position papers for European cooperation on MOOCs*. pp. 113-119. Heerlen:

- EADTU. http://home.eadtu.eu/images/Position_papers_for_European_cooperation_on_MOOCs.pdf
- Kanter, R.M. (1985). *Change Masters: Innovation and Entrepreneurship in the American Corporation*. London: Unwin.
 - Katz, J. A. (2003). The chronology and intellectual trajectory of American entrepreneurship education: 1876–1999. *Journal of Business Venturing*, 18(2). pp. 283-300.
 - Katz, J. A. (2014). Education and training in entrepreneurship. In *The psychology of entrepreneurship* (pp. 241-268). Psychology Press.
 - Kear, K., Williams, K., & Rosewell, J. (2014). Excellence in e-learning: a quality enhancement approach. In: EFQUEL Innovation Forum 2014/International LINQ Conference 2014: Changing the Trajectory – Quality for Opening up Education, 7-9th May 2014, Crete. <http://oro.open.ac.uk/40207/>
 - Kernohan, D. (2013). Risky business: make sure your MOOCs aren't exposing you to legal challenge. *Jisc Inform*, 39. pp.14–19. <https://www.jisc.ac.uk/blog/risky-business-make-sure-your-moocs-arent-exposing-you-to-legal-challenge-06-mar-2014#.U16DjLhdVoA>
 - Khali, M. & Ebner, M. (2017). Clustering patterns of engagement in Massive Open Online Courses (MOOCs): the use of learning analytics to reveal student categories. *Journal of Computing in Higher Education*, 29(1). pp.114-132. <https://link.springer.com/article/10.1007/s12528-016-9126-9>
 - Kizilcec, R. F., Piech, C., & Schneider, E. (2013). Deconstructing disengagement: analyzing learner subpopulations in massive open online courses. In Proceedings of the third international conference on learning analytics and knowledge (pp. 170-179). ACM.
 - Koehl, R. (1977). The Comparative Study of Education: Prescription and Practice. *Comparative Education Review*, 21(2/3). pp.177-194. <http://www.jstor.org/stable/1187656>
 - Kolowich, S. (2013a). A University's Offer of Credit for a MOOC Gets No Takers. *The Chronicle of Higher Education*. <https://www.chronicle.com/article/A-Universitys-Offer-of-Credit/140131>
 - Kolowich, S. (2013b). American Council on Education recommends 5 MOOCs for credit. *The Chronicle of Higher Education*. <https://chronicle.com/article/American-Council-on-Education/137155/>
 - Kolowich, S. (2014c). Coursera will offer certificates for sequences of MOOCs. *The Chronicle of Higher Education*. <http://www.chronicle.com/blogs/wiredcampus/coursera-will-offer-certificates-for-sequences-of-moocs/49581>
 - Kraft (2008). Praxisfall: Fortbildungsveranstaltungen – Freizeit oder Dienstzeit? In: Bilanzbuchhalter, BÖB – Issue 33, March 2008. <http://www.possert.at/data/Fortbildungsveranstaltungen.pdf>
 - Kroes, N., Vassiliou, A. (2013). Opening up Education – Making the 21th century classroom a reality. European Commission. http://europa.eu/rapid/press-release_SPEECH-13-747_en.htm?locale=en
 - Kron, W.F. (2008). *Grundwissen Didaktik*. München: Ernst Reinhardt Verlag.

- Kuratko, D. F. (2005). 'The emergence of entrepreneurship education: development, trends and challenges'. *Entrepreneurship Theory and Practice*, 29(5), pp. 577-598.
- Lackner E., & Kopp, M. (2014), Do MOOCs need a special Instructional Design? *Proceedings of EduLearn 14 Conference*. http://www.researchgate.net/publication/263784897_Do_MOOCs_need_a_Special_Instructional_Design
- Lapal, R. (2015). edX and McKinsey Academy Collaborate on New Social Learning Platform. *edX Blog*. <http://blog.edx.org/edx-mckinsey-academy-collaborate-new>
- Lequerica A. (2016). MOOCwatch February 2016. Class Central. <https://www.class-central.com/report/moocwatch-feb-2016/>
- Littlejohn, A. and Hood, N. (2017). Learning in MOOCs: The [Un]democratisation of Learning. Pushing the boundaries of Higher Education Challenging traditional models with innovative and creative practices, 7 Sep 2017, Barcelona, Spain. <http://oro.open.ac.uk/52720/>
- Liyanagunawardena, T.K., Adams, A.A., Williams, S.A. (2013). MOOCs: A Systematic Study of the Published Literature 2008-2012. *The international Review of Research in Open and Distributed Learning*, 14(3). pp.202-227. <http://www.irrodl.org/index.php/irrodl/article/view/1455/2531>
- Lomas, N. (2016) Online learning platform iversity gets a lifeline from Holtzbrinck media group. TechCrunch. <https://techcrunch.com/2016/08/09/online-learning-platform-iversity-gets-a-lifeline-from-holtzbrinck-media-group/?guccounter=19>
- Lowenthal, P. R., & C. B. Hodges (2015). In search of quality: Using Quality Matters to analyze the quality of massive, open, online, courses (MOOCs). *The International Review of Research in Open and Distributed Learning*, 15(5). <http://www.irrodl.org/index.php/irrodl/article/view/2348/3411>
- MacGregor K., (2013). MOOCs make waves in higher education worldwide. University World News. <http://www.universityworldnews.com/article.php?story=20130920142318192&query=MOOC>
- Mackintosh, W., McGreal, R., Taylor, J. (2011). Open Education Resources (OER) for assessment and credit for students' projects: Towards a logic model and plan for action. Retrieved from. Athabasca University Library & Scholarly Resources. <http://hdl.handle.net/2149/3039>
- Macleod, H., Haywood, J., Woodgate, A., & Alkhatnai, M. (2015). Emerging patterns in MOOCs: Learners, course design and directions. *TechTrends*, 59(1). pp. 56-63. <http://dx.doi.org/10.1007/s11528-014-0821-y>
- Margaryan, A, Bianco, M., & Littlejohn, A. (2015). Instructional quality of Massive Open Online Courses (MOOCs). *Computers & Education*, 80. 77-83. <http://dx.doi.org/10.1016/j.compedu.2014.08.005>
- Martin, B. C., McNally, J. J., & Kay, M. J. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, 28(2). pp. 211-224.
- Matkin, W. G. (2017). Why Digital Credentials Will Render University Transcripts Obsolete and Reshape Higher Education. <https://unbound.upcea.edu/innovation/>

[alternative-credentialing/why-digital-credentials-will-render-university-transcripts-obsolete-and-reshape-higher-education/](#)

- Mayr, K., Resing, P. and Schraz, M. (2009). *E-Learning im Schulalltag*. Kempten: Klinkhard.
- McClure, D. (2010). MoneyBall For Startups: Invest BEFORE Product/Market Fit, Double-Down AFTER 500 Startups. *Business Insider*. <https://www.businessinsider.com/moneyball-for-startups-invest-before-productmarket-fit-double-down-after-2010-8?IR=T>
- McGreal, R., Conrad, D., Murphy, A., Witthaus, G., & Mackintosh, W. (2014). Formalising informal learning: Assessment and accreditation challenges within disaggregated systems. *Open Praxis* 6(2). 125-133. <http://www.openpraxis.org/index.php/OpenPraxis/article/view/114>
- McPhee, I. and Söderström, T. (2012). Distance, online and campus higher education: reflections on learning outcomes. *Campus-Wide Information Systems*. pp. 144-155.
- McPherson, M.S. and Bacow, L.S. (2015). Online Higher Education: Beyond the Hype Cycle', *Journal of Economic Perspectives*, pp. 135-154. <https://www.emeraldinsight.com/doi/abs/10.1108/10650741211243166?journalCode=cwis>
- McPherson, M. & Bacow, L. (2015). Online Higher Education: Beyond the Hype Cycle. *Journal of Economic Perspectives*, 29(4). pp.135-154. <http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.29.4.135>
- Miller, D. (1983). The correlates of entrepreneurship in three types of firms. *Management Science*, 29(7). pp. 770-791.
- Milligan, C., Margaryan, A., Littlejohn, A., (2013). Patterns of engagement in massive open online courses. *MERLOT Journal of Online Learning and Teaching*, 9(2), pp.149-159. http://jolt.merlot.org/vol9no2/milligan_0613.pdf
- Milligan, Colin, Littlejohn, A., Hood, N. (2016). Learning in MOOCs: A Comparison Study, Proceedings of the European Stakeholder Summit on experiences and best practices in and around MOOCs. In: Proceedings of the EUROPEAN STAKEHOLDER SUMMIT on experiences and best practices in and around MOOCs (EMOOCs 2016) (Khalil , Mohammad; Ebner, Martin; Kopp, Michael; Lorenz, Anja and Kalz, Marco eds.), Karl-Franzens-Universität at Graz, Graz, pp. 15–26. <http://oro.open.ac.uk/46383/8/Learninginmoocs.pdf>
- MOOC List (2017). About / Frequently Asked Questions. <http://www.mooc-list.com/content/frequently-asked-questions>
- MOOCs@Edinburgh Group (2013) MOOCs @ Edinburgh 2013: Report #1. <https://www.era.lib.ed.ac.uk/handle/1842/6683>
- Moody's Investor Service (2013). US Higher Education Outlook Negative in 2013. https://www.moody.com/research/Moodys-2013-outlook-for-entire-US-Higher-Education-sector-changed-PR_263866
- Mulder, F., & Jansen. D. (2015). MOOCs for Opening Up Education and the OpenupEd initiative. In: C. J. Bonk, M. M. Lee, T. C. Reeves, T. H. Reynolds (Eds.). *The MOOCs and Open Education Around the World*. New York: Routledge Taylor & Francis Group. http://www.eadtu.eu/documents/Publications/OEenM/OpenupEd_-

[_MOOCs_for_opening_up_education.pdf](#)

- Mwasalwiba, E. S. (2010). Entrepreneurship Education: a review of its objectives, teaching methods and impact indicators. *Education and Training*, 52(1). pp. 20-47.
- Muñoz, J.-C., Punie, Y. & dos Santos, A.-I. (2016). MOOCs in Europe: Evidence from pilot surveys with universities and MOOC learners. https://ec.europa.eu/jrc/sites/jrcsh/files/JRC%20brief%20MOOCs_JRC101956.pdf
- Nafukho, F.M. and Muyia, M.H. (2013). The World Bank's Africa Virtual University Project: a revisit *European Journal of Training and Development*, pp. 646-661.
- National Research Council (2008). Common standards for K-12 education: Considering the evidence. Washington: The National Academies Press.
- Neuböck, K., Kopp, M., & Ebner, M. (2015). What do we know about typical MOOC participants? First insights from the field. In: EMOOCS2015. Proceedings Papers. European Stakeholder Summit on Experiences and best practices in and around MOOCs. 18-20 May 2015. Université Catholique de Louvain, Mons (Belgium). pp.183-190.
- Neumann, T. (2009). Errichtung einer Wissensmanagement Plattform für ein internationales Unternehmen. B.A. Hochschule Mittweida.
- Nisha, F., Senthil, V. (2015). MOOCs: Changing Trend Towards Open Distance Learning with Special Reference to India. *Journal of Library & Information Technology*, 35(2). pp.82-89. DOI: 10.14429/djlit.35.2.8191
- Nordkvelle Y, Fosslund T., & Netteland G. (eds.) (2013). *Kvalitet i høyere utdanning*. Norges universitet Oslo: Akademiska Forlag. http://norgesuniversitetet.no/files/kvalitet_i_fleksibel_hoyere_utdanning.pdf
- Norvig, P. (2012) Helping the world to teach. <http://googleresearch.blogspot.com/2012/09/helpingworld-to-teach.html>
- O'Connor, K. (2014). MOOCs, institutional policy and change dynamics in higher education. *Higher Education* 68:623–635 DOI 10.1007/s10734-014-9735-z
- OECD (2012). Education Indicators in Focus (January). <http://www.oecd.org/education/skills-beyond-school/Education%20Indicators%20in%20Focus%206%20June%202012.pdf>
- OECD (2013a). Education at a Glance: 2013 OECD indicators. OECD Publishing. [http://www.oecd.org/education/eag2013%20\(eng\)-FINAL%2020%20June%202013.pdf](http://www.oecd.org/education/eag2013%20(eng)-FINAL%2020%20June%202013.pdf)
- OECD (2013b). Education Indicators in Focus (December). [http://www.oecd.org/education/skills-beyond-school/EDIF%202013-N%C2%B018%20\(eng\).pdf](http://www.oecd.org/education/skills-beyond-school/EDIF%202013-N%C2%B018%20(eng).pdf)
- Online Course Report (2016). State of the MOOC 2016: A Year of Massive Landscape Change For Massive Open Online Courses. <https://www.onlinecourserreport.com/state-of-the-mooc-2016-a-year-of-massive-landscape-change-for-massive-open-online-courses/>
- Open Knowledge Foundation (2014). *Open Education Handbook*. <http://booktype.okfn.org/open-education-handbook-2014/what-is-open-education/>

- OpenupEd (2014). Definition Massive Open Online Courses (MOOCs). http://www.openuped.eu/images/docs/Definition_Massive_Open_Online_Courses.pdf
- Ospina-Delgado, J.E. , Zorio-Grima, A. , García-Benau, M-A. (2012). Massive open online courses in higher education: A data analysis of the MOOC supply. *Intangible Capital*. <http://dx.doi.org/10.3926/ic.798>
- Ossiannilsson, E., Altinay, F. & Altinay, Z. (2016). MOOCs as Change Agents to Boost Innovation in Higher Education Learning Arenas. *Education Sciences* 6(3). <https://doi.org/10.3390/educsci6030025>
- Ossiannilsson, E., Williams, K., Camilleri, A.F., & Brown, M.L. (2015). Quality models in online and open education around the globe: State of the art and recommendations. International Council for Distance Education. <http://icde.org/admin/filestore/Resources/Reports/ICDEQualitymodels2.pdf>
- Osterwalder, A. (2004). The Business Model Ontology – A Proposition In A Design Science Approach. PhD thesis, University of Lausanne. http://www.hec.unil.ch/aosterwa/PhD/Osterwalder_PhD_BM_Ontology.pdf
- Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: A handbook for visionaries, game changers, and challengers*. New York, NY: Wiley.
- Osterwalder, A., Pigneur, Y., Bernada, G., Smith, A., & Papadacos, T. (2014). *Value Proposition Design: How to Create Products and Services Customers Want* (Strategyzer), John Wiley & Sons, Inc.
- Otten H., & Ohana, Y. (2009). The Eight Key Competencies for Lifelong Learning: An appropriate framework for developing the competence of trainers in the field of European youth work or just plain politics? Bonn: SALTO. http://www.ikab.de/wp-content/uploads/Otten_Ohana_8keycompetence_study_2009.pdf
- Pappano, L. (2012). The Year of the MOOC. *New York Times* (Nov 2nd). <http://www.nytimes.com/2012/11/04/education/edlife/massive-open-online-courses-are-multiplying-at-a-rapid-pace.html?>
- Patru, M., & Balaji, V. (2016). Making Sense of MOOCs. A guide for Policy-Makers. United Nations Educational, Scientific and Cultural Organization (UNESCO). <http://unesdoc.unesco.org/images/0024/002451/245122E.pdf>
- Pickard, L. (2018). Analysis of 450 MOOC-Based Micro-credentials Reveals Many Options But Little Consistency. Class Central. <https://www.class-central.com/report/moocs-micro-credentials-analysis-2018/>
- Pierson, M.W., Terrell, R.R., & Wessel, M.F. (2013). Massive Open Online Courses (MOOCs): Intellectual Property and Related Issues. The National Association of College and University Attorneys, Session 5G. http://www.higheredcompliance.org/resources/publications/AC2013_5G_MOOCsPart11.pdf
- Pinchot, G. (1985). Intrapreneuring: Why You Don't Have to Leave the Corporation to Become an Entrepreneur. University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1496196

- Pintrich, P. R. (1999). The role of motivation in promoting and sustaining self-regulated learning. *International Journal of Educational Research*, (31). pp. 459-470.
- Pittaway, L. & Cope, J. (2007). Entrepreneurship education: a systematic review of the evidence. *International Small Business Journal*, 25(5). pp. 479-510.
- Pixabay. (2015). Public Domain Images-What is allowed and what is not? <https://pixabay.com/en/blog/posts/public-domain-images-what-is-allowed-and-what-is-4/>
- Pongratz, H. (2014). Talking about Data. Data ownership, ethics and intellectual property. <https://es.scribd.com/doc/207956432/EMOOCs-2014-Policy-Track-4-Pongratz>
- Protalinski, E. (2013). Coursera partners with 13 new institutions to pass 100 total, eclipses 5 million students and 500 courses too. *The NextWeb* (October 24). <https://thenextweb.com/insider/2013/10/24/coursera-partners-13-institutions-pass-100-total-sees-5-million-students-500-courses/#!ALMfi>
- Radford, A.W., Coningham, B., Horn, L. (2015). MOOCs: Not just for college students- How organizations can use MOOCs for Professional Development. *Employment Relations Today*, 41(4). pp. 1-15.
- Rae, D. (2005). Entrepreneurial learning: a narrative-based conceptual model. *Journal of Small Business & Enterprise Development*, 12(3). pp. 323-35.
- Rae, D. (2010). Universities and enterprise education: responding to the challenges of the new era. *Journal of Small Business and Enterprise Development*, 17(4). pp. 591-606
- Raposo, M. & Paco, A. (2011). Entrepreneurship education: relationship between education and entrepreneurial activity. *Psicothema*, 23(3). pp. 453-457.
- Ricketson, S. (2003). WIPO Study on Limitations and Exceptions of Copyright and Related Rights in the Digital Environment". WIPO. http://www.wipo.int/edocs/mdocs/copyright/en/sccr_9/sccr_9_7.pdf
- Ries, E. (2011). *The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses*. New York: Crown Business.
- Ries, E. (2017). *The Startup Way: How Modern Companies Use Entrepreneurial Management to Transform Culture and Drive Long-term Growth*. Currency.
- Rigg C. & O'Dwyer, B. (2012). Becoming an entrepreneur: researching the role of mentors in identity construction. *Education and Training*, 54(4). pp. 319-329.
- Rivard R., (2013). Rubber Hits the Road. *Inside Higher Education*. <https://www.insidehighered.com/news/2013/08/08/researchers-wait-see-if-students-want-transfer-credits-moocs>
- Robertson S. & Komljenovic, J. (2016). Unbundling the University and Making Higher Education Markets. In Verger, A., Lubienski, C., Steiner-Kamsi, G. (eds). *The Global Education Industry* (Vol. 2016). (World Yearbook in Education). London: Routledge. pp.211-227.
- Rodriguez, C. O. (2012). MOOCs and the AI-Stanford like Courses: Two Successful and Distinct Course Formats for Massive Open Online Courses. *European Journal of Open, Distance and E-Learning*. <http://www.eurodl.org/>

[index.php?p=archives&year=2013&halfyear=2&article=516](http://papers.efquel.org/index.php?p=archives&year=2013&halfyear=2&article=516)

- Rosewell, J., & Jansen, D. (2014). The OpenupEd quality label: benchmarks for MOOCs. *The International Journal for Innovation and Quality in Learning*, 2(3). pp. 88–100. <http://papers.efquel.org/index.php/innouqual/article/view/160>
- Rychen, D. S. & Hersch, S. L. (eds.) (2003). *Key Competencies for a Successful Life and a Well-Functioning Society*. Cambridge, MA: Hogrefe & Huber
- Schön, S.; Ebner, M.; Rothe, H.; Steinmann, R. & Wenger, F. (2013). *Macht mit im Web! Anreizsysteme zur Unterstützung von Aktivitäten bei Community- und Content-Plattformen*. Güntner, G. & Schaffert, S. (eds.). Salzburg: Salzburg Research.
- Schroeder, R. (2012). Emerging Open Online Distance Education Environment. *Continuing Higher Education Review* 76. pp.90– 99.
- Schulmeister, R. (2005). Lernplattformen für das virtuelle Lernen. Evaluation und Didaktik, Oldenburg.
- Schwab, K. (2015). *The Global Competitiveness Report 2015-2016*. World Economic Forum. http://www3.weforum.org/docs/gcr/2015-2016/Global_Competitiveness_Report_2015-2016.pdf
- Schwartz, J., Bohdal-Spiegelhoff, U., Gretczko M., Sloan, N. (2016). *Global Human Capital Trends 2016*. Deloitte. <http://www2.deloitte.com/us/en/pages/human-capital/articles/introduction-human-capital-trends.html>
- Shah D. (2014). MOOCs in 2014: Breaking down the numbers. EdSurge. <https://www.edsurge.com/n/2014-12-26-moocs-in-2014-breaking-down-the-numbers>
- Shah, D. (2017a). By The Numbers: MOOCs in 2017. Class Central. <https://www.class-central.com/report/mooc-stats-2017/>
- Shah, D. (2017b). Udacity's Revenues Reach \$70 Million in 2017. Class Central. <https://www.class-central.com/report/udacity-revenues-2017/>
- Shah, D. (2018a). A product at every price: A review of MOOC stats and trends in 2017. Class Central. <https://www.class-central.com/report/moocs-stats-and-trends-2017/>
- Shah, D. (2018b). MOOCWatch #17: MOOCs Become Big Business. Class Central. <https://www.class-central.com/report/moocs-become-big-business/>
- Shane, S. & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1). pp. 217–226.
- Shane, S. A. (2000). *A general theory of entrepreneurship: The individual-opportunity nexus*. Edward Elgar Publishing.
- Sharples, M., McAndrew, P., Weller, M., Ferguson, R., Fitzgerald, E., Hirst, T., and Gaved, M. (2013). *Innovating Pedagogy 2013: Open University Innovation Report 2*.Milton Keynes: The Open University.
- Shepard, L.A., Hannaway, J. and Baker, E. (2009) Standards, Assessments and Accountability: Education policy white paper, Washington: National Academy of Education.
- Shuttleworth Foundation/Open Society Foundation (2008). The Cape Town Open Education Declaration. <http://www.capetowndeclaration.org/>

- Siemens, G. (2005) Connectivism: A Learning Theory for the Digital Age. http://www.itdl.org/journal/jan_05/article01.htm
- Siemens, G. (2012) MOOCs are really a platform. <http://www.elearnspace.org/blog/2012/07/25/moocs-are-really-a-platform/>
- Skiba, D. J. (2012). Disruption in Higher Education: Massively Open Online Courses (MOOCs). *Nursing Education Perspectives*, 33(6). pp.416-417.
- Slotte, V. & Tynjälä, P. (2005). Communication and Collaborative Learning at Work: Views Expressed on a Cross-Cultural E-Learning Course. *International Journal of E-Learning*. pp. 191-207.
- Smutz, W. (2013). MOOCs Are No Education Panacea, but Here's What can Make Them Work. *Forbes*. <http://www.forbes.com/sites/forbesleadershipforum/2013/04/08/moocs-are-no-educationpanacea-but-heres-what-can-make-them-work/?cid=dlvr.it>
- Solomon, G.T., Duffy, S., & Tarabishy, A. (2002). The state of entrepreneurship education in the United States: A nationwide survey and analysis. *International Journal of Entrepreneurship Education*, 1(1). pp. 65–86.
- Sreeleakha P., and Manikandan, N. (2015). The Way Forward with MOOCs – Professional Development Perspectives. *American International Journal of Research in Humanities, Arts and Social Sciences*. pp.29-32. <http://iasir.net/AIJRHASSpapers/AIJRHASS15-514.pdf>
- Stacey, P. (2013). The Pedagogy Of MOOCs. Ed Tech Frontier. <http://edtechfrontier.com/2013/05/11/the-pedagogy-of-moocs/>
- Stacey, P. (2015). Traditional Economics Don't Make Sense for Open Business Models. Medium. <https://medium.com/made-with-creative-commons/traditional-economics-don-t-make-sense-for-open-business-models-d277428535e0#.kl72wz9de>
- Stamatiadis, F. and Petropoulou, M. (2006). The Factors Affecting the Decision to e-Learning: A Case Study. In Remenyi, D. (ed.) *Proceedings of the 5th European Conference on eLearning*. Dublin: Trinity College Dublin.
- Stevenson, H. H. & Jarillo, J. C. (1990). A paradigm of entrepreneurship: Entrepreneurial management. *Strategic Management Journal*, 11(5). pp. 17-27.
- Stevenson, L. & Lundström, A. (2001). Patterns and Trends in Entrepreneurship/SME Policy and Practice in ten Economies. *Entrepreneurship Policy for the Future Series* (3). pp. 11-32.
- Strebels, P. and Keys, T. (2005). *Mastering Executive Education – How to combine content with context and emotion*. Harlow: Pearson Education.
- Taylor, J. C. (2011). The OER university: From logic model to action plan. Keynote Address. Open Planning meeting for the OER assessment and credit for students project, Otago Polytechnic, 23 February 2011, Dunedin, New Zealand. http://wikieducator.org/OERU_meeting_summary
- Tickle L. (2014). Will degree made up of MOOCs ever be worth the paper it's written on? *The Guardian* (June 12). <http://www.theguardian.com/higher-education-network/blog/2014/jun/12/moocs-viable-alternative-traditional-degree>

- Timmons J.A (1985). *New Venture Creation*. Homewood Illinois
- Todorovski B., Nordal, E., & Isoski, T. (2015). Overview on student-centred learning in Higher Education in Europe – research study, Brussels: the European Students’ Union.
- Treadway, J., Ayala, C., & Dick, G.N. (2013). Harnessing “MOOCs” – can they be part of MBA courses? Proceedings. Paper 7. <http://aisel.aisnet.org/siged2013/7>
- Tseng, S.-F., Tsao, Y.-W., Yu, L.-C., Chan, C.-L. & Robert Lai, K. (2016). Who will pass? Analyzing learner behaviors in MOOCs. *Research and Practice in Technology Enhanced Learning* 11(8). <https://doi.org/10.1186/s41039-016-0033-5>
- UNESCO (2016). Education 2030: Incheon Declaration and Framework for Action: towards inclusive and equitable quality education and lifelong learning for all. <http://unesdoc.unesco.org/images/0024/002432/243278e.pdf>
- UNESCO and Commonwealth on Learning (2011, 2015). Guidelines for Open Educational Information in Higher Education. Paris.
- UNESCO-COL (2016). Making Sense of MOOCs: A Guide for Policy-Makers in Developing Countries. <http://unesdoc.unesco.org/images/0024/002451/245122E.pdf>
- Universities UK (2013). Massive open online courses: higher education’s digital moment? <http://www.universitiesuk.ac.uk/policy-and-analysis/reports/Documents/2013/massive-open-online-courses.pdf>
- Vassiliou, A. (2013). First European MOOCs – a milestone for education. European Commission (April 25). http://europa.eu/rapid/press-release_SPEECH-13-368_en.htm?locale=en
- Venkataraman, S, Sarasvathy, S. D., Dew, N., & Forster, W.R., (2012). Reflections on the 2010 AMR decade award: Whither the promise? Moving forward with entrepreneurship as a science of the artificial. *Academy of Management Review*, 37(1). pp. 21-33.
- Veeramachaneni, K., Derroncourt, T., Taylor, C., Pardos, Z., & O’Reilly, U.M. (2013). Moccdb: Developing data standards for MOOC data science. http://groups.csail.mit.edu/EVO-DesignOpt/groupWebSite/uploads/Site/EdTR_Dec2_2013.pdf
- Verstelle, M., Schreuder, M., & Jelgerhuis, H. (2014). Recognition of MOOCs in the Higher Education Sector. In R. Jacobi, N.V.D. Woert, & H. Jelgerhuis (Eds.), *Trend report: Open Educational Resources 2014* (pp. 24-32). <http://www.surf.nl/binaries/content/assets/surf/en/2014/trendrapport-open-education-2014-eng.pdf>
- Vestergaard, K., Moberg, K. & Jørgensen, C. (eds.) (2012). *Impact of Entrepreneurship Education in Denmark – 2011*. The Danish Foundation for Entrepreneurship – Young Enterprise. http://eng.ffe-ye.dk/media/202248/impact_of_entrepreneurship_education_in_denmark_2011.pdf
- Viki, T., Toma, D., & Gons, E. (2017). *The Corporate Startup: How established companies can develop successful innovation ecosystems*. Vakmedianet.
- Volery, T. and Lord, D. (2000). Critical success factors in online education. *International Journal of Educational Management*. pp. 216-223.
- Von Graevenitz, G., Harhoff, D., & Weber, R. (2010). The effects

- of entrepreneurship education. *Journal of Economic Behavior & Organization*, 76(1). pp.90-112.
- Wahid, R., Sani, A.M., Mat B., Subhan, M., Saidin, K. (2015). Sharing Works and Copyright Issues in Massive Open Online Courseware (MOOC). *International Journal for Research in Emerging Science and Technology*, 2(10), pp. 24-29.
 - Wai-chung Yeung, H. (1995). Qualitative Personal Interviews in International Business Research: Some Lessons from a Study of Hong Kong Transnational Corporations. *International Business Review*, 4(3). pp.313-339.
 - Walton Radford, A., Coningham, B., Horn, L., (2015). MOOCs: Not just for college students – How organizations can use MOOCs for Professional Development. *Employment Relations Today* 41(4). pp.1-15.
 - Wang, Y. & Baker, R. (2015). Content or platform: Why do students complete MOOCs? *MERLOT Journal of Online Learning and Teaching*, 11(1). http://jolt.merlot.org/vol11no1/Wang_0315.pdf
 - Weller, M. (2014). *Battle for Open: How openness won and why it doesn't feel like victory*. London: Ubiquity Press. <http://dx.doi.org/10.5334/bam>
 - Weller, M. (2015) 2016 – the year of MOOC hard questions. Ed Techie. <http://blog.edtechie.net/mooc/2016-the-year-of-mooc-hard-questions/>
 - Weller, M. and Anderson, T. (2013). Digital resilience in Higher Education. *European Journal of Open, Distance and E-Learning*, 16(1). http://oro.open.ac.uk/36988/1/Weller_Anderson.pdf
 - Welsh, D. & Dragusin, M. (2013). The New Generation of Massive Open Online Course (MOOCS) and Entrepreneurship Education. *Small Business Institute Journal*, 9(1). pp.51-65.
 - White, S., Davis, H., Dickens, K. P., Leon, M., & Sanchez Vera, M. (2015). MOOCs: What motivates producers and participants. In S. Zvacek, M. Restivo, J. Uhomoihi, & M. Helfert (Eds.), *Proceedings of the 6th International Conference on Computer Supported Education*. Heidelberg: Springer. pp. 99-114.
 - Wiley, D. (2007). On the Sustainability of Open Educational Resource Initiatives in Higher Education. OECD. <https://www1.oecd.org/edu/cei/38645447.pdf>
 - Xalabarder, R. (2004). Copyright exceptions for teaching purposes in Europe. UOC/ Internet Interdisciplinary Institute. <https://www.uoc.edu/in3/dt/eng/20418/20418.pdf>
 - Yang, A. (2016). Why Entrepreneurship Education Does Not Work. <https://www.forbes.com/sites/andrewyang/2016/02/25/entrepreneurship-education-does-not-work/>
 - Yang, J. (2015). Recognition, validation and accreditation of non-formal and informal learning in UNESCO Member States. UNESCO Institute for Lifelong Learning.
 - Kalman, Y. M. (2014). A race to the bottom: MOOCs and higher education business models. *Open Learning: The Journal of Open, Distance and e-Learning*, 29(1). <https://doi.org/10.1080/02680513.2014.922410>
 - Yuan, L., & Powell, S. (2013). MOOCs and open education: Implications for higher

education. JISC CETIS. <https://publications.cetis.org.uk/wp-content/uploads/2013/03/MOOCs-and-Open-Education.pdf>

- Zahra, S. A. & Kuratko, D. F. (1990). The antecedents and consequences of firm-level entrepreneurship: the state of the field. *Entrepreneurship Theory and Practice*, 24(2). pp. 45-65
- Zhang, D. (2003). Powering E-Learning In the New Millennium: An Overview of E-Learning and Enabling Technology. *Information Systems Frontiers*, 5(2). pp. 201- 212. https://www.researchgate.net/profile/Jay_Nunamaker/publication/220199021_Powering_E-Learning_In_the_New_Millennium_An_Overview_of_E-Learning_and_Enabling_Technology/links/0912f50fdd6e1d5fcf000000.pdf
- Zheng, S., Rosson, M. B., Shih, P. C., & Carroll, J. M. (2015). Understanding Student Motivation, Behaviors and Perceptions in MOOCs. In *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing* (pp. 1882- 1895). ACM.
- Zhenghao, C., Alcorn, B., Christensen, G., Eriksson, N., Koller, D., & Emanuel, E.J. (2015). Who's Benefiting from MOOCs, and Why., *Harvard Business Review*. <https://hbr.org/2015/09/whos-benefiting-from-moocs-and-why>
- Zhu, M., Sari, A., & Lee, M. M. (2018). A systematic review of research methods and topics of the empirical MOOC literature (2014–2016). *The Internet and Higher Education*, 37 (April). pp 31-39. <https://doi.org/10.1016/j.iheduc.2018.01.002>
- Zur, A., (2014). Entrepreneurial education for social responsibility. *Przedsiębiorczość – Edukacja*, 10. pp. 346-353.

22.

RESOURCES

Tools and templates from BizMOOC

Tool / Template	What and when to use	Link
Course Planner by the Open University	A really helpful tool for MOOC design. Define your general course information, week overview, learning outcomes plus workload and create one detailed spreadsheet for each week. We have used this template for our Pilot MOOC production. You may adapt it to your needs.	http://mooc-book.eu/wp-content/uploads/2018/10/OU-general-course-planner-shared-version.xlsm (CC-BY-NC-SA license)
MOOC Canvas	A conceptual framework for supporting educators in the description and design of MOOCs. The MOOC Canvas is inspired by the Business Model Canvas and defines eleven interrelated issues that are addressed through a set of questions, offering a visual and understandable guidance for educators during the MOOC design process.	https://www.it.uc3m.es/calario/MOOCCanvas/index.html
MOOC Design Patterns	A set of design patterns that can be employed to design the MOOC and its activities. The design patterns can be downloaded as a set of cards to be printed.	http://www.moocdesign.cde.london.ac.uk/outputs/patterns http://www.moocdesign.cde.london.ac.uk/outputs/design-pattern-cards
Review template MOOC design	Template one can (re-)use to review the design of a MOOC. The quality dimensions and criteria are based on existing literature and aligned with those used in other MOOC projects and by MOOC platforms	http://mooc-book.eu/wp-content/uploads/2018/10/BizMOOC-Review-Template-MOOC-Design.docx (CC-BY license)
Pre-MOOC survey amongst MOOC participants	Questionnaire about characteristics and intentions amongst participants before the MOOC starts	http://mooc-book.eu/wp-content/uploads/2018/10/BizMOOC-Pre-Course-Survey-MOOC-participants.docx (CC-BY license)
Post-MOOC evaluation survey amongst participants	Questionnaire for evaluating MOOCs amongst participants after the MOOC ended.	http://mooc-book.eu/wp-content/uploads/2018/10/BizMOOC-Post-Course-Survey-MOOC-participants.docx (CC-BY license)
Pre-MOOC expert evaluation	Open questions used to get feedback from external experts before MOOC starts. This has a generic framework but some questions are tailored to specific aim and target group of the MOOC.	http://mooc-book.eu/wp-content/uploads/2018/10/BizMOOC-Pre-MOOC-Expert-Evaluation.docx (CC-BY license)
Post-MOOC expert evaluation	Open questions used to get feedback from external experts in focus group session after MOOC ended. Again this has a generic framework but some questions are tailored to specific aim and target group of the MOOC.	http://mooc-book.eu/wp-content/uploads/2018/10/BizMOOC-Post-MOOC-Expert-Evaluation.docx (CC-BY license)

**Learning Design Instruction
Video**

At the start of the Pilot MOOC production in the BizMOOC project, the whole team received a training at the Open University UK to the principles of Learning Design. A video was recorded as an introduction to LearningDesign for everyone who is interested.

<https://www.youtube.com/watch?v=tA5K7nlQ2e0>

(CC-BY-NC-SA license)

ACKNOWLEDGEMENTS

This open textbook was built upon the work of many researchers involved with the BizMOOC project. Here you can find details of the original source materials that were drawn upon to complete this volume.

The text in this volume is remixed from the BizMOOC MOOC BOOK, which is archived at <http://mooc-book.eu/>.

The earlier parts of the book draw on several general resource and FAQ from the BizMOOC project.

- <http://mooc-book.eu/index/key-questions/> (Author: BizMOOC)
- <http://mooc-book.eu/index/learn-more/key-areas/about-moocs/> (Author: Darco Jansen)
- <http://mooc-book.eu/index/learn-more/key-areas/drivers/> (Author: Darco Jansen)
- <http://mooc-book.eu/index/learn-more/project-reference/> (Author: BizMOOC)

Acknowledgements for **[Massive Open Online Courses for business and society](#)**:

- [MOOC for a Learning Society](#) is based on <http://mooc-book.eu/index/learners/key-questions/> (Author: BizMOOC)
- [Attitudes towards MOOC](#) is based on <http://mooc-book.eu/index/learn-more/analysis/society-survey-on-moocs/> (Authors: Oana M. Driha; Christian Friedl; Darco Jansen)
- [MOOC for the world of business](#) is based on <http://mooc-book.eu/index/business/key-questions/> (Author: BizMOOC); <http://bizmooc.eu/wp-content/uploads/2016/02/BizMOOC-R1.3a-Organisations-report.pdf> (Authors: Oana M. Driha; Christian Friedl; Darco Jansen); & <http://mooc-book.eu/index/learn-more/key-areas/initiatives/> (Authors: Anastasia Sfiri; Karolina Pietkiewicz; Darco Jansen (EADTU))
- [Perspectives from Business](#) is based on <http://mooc-book.eu/index/learn-more/analysis/report-businesses/> (Authors: Oana M. Driha; Christian Friedl; Darco Jansen)
- [Key issues in MOOC research and provision](#) is based on <http://mooc-book.eu/index/higher-education/key-questions/> (Author: BizMOOC)
- [The role of higher education](#) is based on <http://mooc-book.eu/index/learn-more/analysis/report-heis/> (Authors; Oana M. Driha; Maryna Makeienko; Christian Friedl; Darco Jansen) and <http://bizmooc.eu/wp-content/uploads/2016/02/BizMOOC-R1.3a-Organisations-report.pdf> (Authors: Oana M. Driha; Christian Friedl; Darco Jansen)

Acknowledgements for **[Effective Practice in MOOC Provision](#)**:

- [Designing your MOOC: Top Tips](#) is based on <http://mooc-book.eu/index/insights/lessons->

- [learnt/course-design/](#) (Author: BizMOOC) & <http://mooc-book.eu/index/insights/recommendations/course-design/> (Author: BizMOOC)
- [Encouraging active participation](#) is based on <http://mooc-book.eu/index/insights/lessons-learnt/participation/> (Author: BizMOOC) & <http://mooc-book.eu/index/insights/recommendations/participation-and-completion/> (Author: BizMOOC)
 - [MOOC in the workplace](#) is based on <http://mooc-book.eu/index/insights/lessons-learnt/moocs-in-business/> (Author: BizMOOC) & <http://mooc-book.eu/index/insights/recommendations/moocs-in-business/> (Author: BizMOOC)
 - [Teaching & Learning in a MOOC](#) is based on <http://mooc-book.eu/index/learn-more/key-areas/types/> (Authors: Sarah Bridgeman; Martin Weller; Robert Farrow)
 - [Improving quality](#) is based on <http://mooc-book.eu/index/learn-more/key-areas/quality/> (Author: Darco Jansen)
 - [Best Practices](#) is based on <http://mooc-book.eu/index/good-practice/> (Author: BizMOOC)

Acknowledgments for **Focus Areas**:

- [Recognition & Accreditation](#) is based on <http://mooc-book.eu/index/learn-more/key-areas/certification/> (Authors: Karolina Pietkiewicz; Oana M. Driha)
- [Intellectual Property & Copyright](#) is based on <http://mooc-book.eu/index/learn-more/key-areas/ipr/> (Authors: Oana M. Driha; Vicente Zafrilla). The section on copyright uses content from <https://simple.wikipedia.org/wiki/Copyright> under a CC-BY licence.
- [MOOC Business Models](#) is based on <http://mooc-book.eu/index/learn-more/key-areas/business-models/> (Authors: Thomas Staubitz; Darco Jansen; Michael Obrist)
- [Developing Human Resources](#) is based on <http://mooc-book.eu/index/learn-more/key-areas/mooc-hrd/> (Authors: Ines Roiderer; Thomas Neumann)
- [Fostering Innovation and Creativity](#) is based on <http://mooc-book.eu/index/learn-more/key-areas/innovation-moocs/> (Authors: Michael Obrist; Mariya Zheleva)
- [Entrepreneurship](#) is based on <http://mooc-book.eu/index/learn-more/key-areas/13-entrepreneurship-moocs/> (Authors: Christian Friedl; Christoph Resei; Agnes Zur; Andrea Kalafúsová)
- [Lifelong Learning](#) is based on <http://mooc-book.eu/index/learn-more/key-areas/ll-competences/> (Author: Karolina Pietkiewicz)

GLOSSARY

Accessibility

The extent to which disabled students can access, on an equal basis with others, the learning and teaching content of an online course in order to achieve the learning outcomes.

Accessibility includes technical aspects such as conforming to Web standards; the provision of alternative formats; and processes for making reasonable adjustments to accommodate individual needs which provide equal access and equal opportunity to people with disabilities.

Further information:

– W3C Web Accessibility Initiative (WAI)

<https://www.w3.org/WAI/>

– Introduction to Web Accessibility (from the WAI): <https://www.w3.org/WAI/intro/accessibility.php>

– Model Policy for Inclusive ICTs in Education for People with Disabilities : <http://unesdoc.unesco.org/images/0022/002272/227229e.pdf>

– Guidelines for Accessible Information (from ICT For Information Accessibility in Learning): [http://www.ict4ial.eu/sites/default/files/](http://www.ict4ial.eu/sites/default/files/Guidelines%20for%20Accessible%20Information_EN.pdf)

[Guidelines%20for%20Accessible%20Information_EN.pdf](http://www.ict4ial.eu/sites/default/files/Guidelines%20for%20Accessible%20Information_EN.pdf) and <http://www.ict4ial.eu/guidelines-accessible-information>

– Web Accessibility (from The EU Internet Handbook) http://ec.europa.eu/ipg/standards/accessibility/index_en.htm

– Guidelines from Universal Design for Learning : <http://www.udlcenter.org/aboutudl/udlguideline>

– AbilityNet’s Factsheets : <https://abilitynet.org.uk/factsheets>

Accreditation

The process of formally recognising the learning that has taken place against specific achievement criteria. This can be in the form of credits towards a qualification.

In Higher Education, accreditation is the process by which one institution gains authority to award, and/or gains recognition of, its qualifications from another senior competent authority.

Further information:

– European Accreditation

<http://www.european-accreditation.org/>

Assessment

The evaluation of the learning that has taken place against a set of achievement criteria. Assessment can take different forms, such as formative “ongoing” feedback and summative exams or coursework.

Formative assessment is aimed primarily at determining the strengths and weaknesses of a student's work, with the objective of improvement. Formative assessment demands feedback to the student in some form and may, but will not always, contribute to summative assessment.

Summative assessment is aimed at evaluating student learning at the end of an instructional unit by comparing it against some standard or benchmark.

Peer assessment/review is an assessment/review of students' work carried out by other students.

Self-assessment is an evaluation of one's own abilities.

Asynchronous

Not occurring at the same time; for example, a discussion in an online forum may not result in participants engaging at the same time as each other.

Asynchronous learning is a general term used to describe forms of education, instruction, and learning that do not occur in the same place or at the same time.

Attractors

A characteristic that provides pleasure and attracts. Often used in the context of enablers and drivers of education.

Blended

A mix of online instruction using different media and face-to-face teaching.

Business Model

A theoretical model used in science and business contexts.

Although the concept was developed in the context of for-profit businesses, it is now applied to any type of organisation, including for-profit, non-profit, and governmental.

There are many versions of business models: Al-Debei (2008) identified four primary dimensions while Yoram (2014) comprised the following three components: (1) Customer Value Proposition; (2) Infrastructure (both resources and processes); and (3) Financial Aspects.

Business Model Canvas (BMC)

A strategic management template for developing new business models.

Further information:

– Wikipedia: Business Model Canvas

https://en.wikipedia.org/wiki/Business_Model_Canvas

C-MOOC

A cMOOC or "connectivist MOOC" creates a network of participants who find and exchange resources with each other. The knowledge is distributed and partly self-generated, and the coherence of the course as well as its progression are constructed by the learner. The participants can enrich the MOOC, and the community helps to construct and distribute the content.

Certification

The formal recognition that an individual has demonstrated a proficiency within, and comprehension of, a specific body of knowledge.

Collaborative learning

Learning through the exchange and sharing of information and opinions among a peer group.

Completion rate

The number of learners who earned a certificate of completion or 'passed' the course.

Connectivism

A learning theory that emphasises a "social" network at the centre of the approach. It has been used widely in the more experimental MOOCs, also known as cMOOCs.

Content

Digital teaching material provided to learners. Online learning content can include text, audio, video, animations, simulations and more.

Continuous Professional Development

The means by which people at work maintain, improve and broaden their knowledge and skills and develop competences required in their professional lives.

Copyleft

The practice of offering people the right to freely distribute copies and modified versions of a work with the stipulation that the same rights be preserved in derivative works down the line.

Copyright

A legal means of protecting an author's work.

Corporate entrepreneurship

The entrepreneurial behaviour exhibited by the company itself. Corporate Entrepreneurship is a process of creation of new businesses, and other innovative activities, such as development of new products, services, technologies, administrative techniques, strategies and competitive postures.

Course

A unit of study, typically with a workload of more than 25–30 hours, that includes: (a) a study guide/syllabus with instructions on how to learn from the presented materials and interactions; (b) educational content, which may include video, audio, text, games (including simulations), social media and animation; (c) possibilities for interaction, such as social media channels, forums, blogs or RSS readers to build a learning community; (d) activities/tasks, tests and feedback, which can be automatically generated (e.g., quizzes), as well as peer feedback and/or general feedback from academic staff; (e) exams, including some kind of recognition options.

Credential

A term sometimes used to refer to a qualification (or partial qualification).

Credit

The currency providing a measure of learning outcomes achieved in a notional time at a given level.

Curriculum

A broad term covering both academic and subject requirements, and the processes for

organising and managing the teaching and learning.

Digital badge

A digital assessment and credentialing mechanism that is used to acknowledge the learning that has taken place.

Badges are designed to make visible and validate learning in both formal and informal settings, and hold the potential to help transform where and how learning is valued.

Digital library

A library that has collections with electronic materials such as eJournals, online databases, and eBooks.

Digital literacy

The knowledge, skills and behaviours used in a broad range of digital devices.

Digital literacy is about competently using digital devices to achieve goals related to work, employability, learning and leisure.

Diversity

The inclusion of individuals representing more than one national origin, colour, religion, socioeconomic stratum, sexual orientation, etc.

Drivers

Institutional drivers define influences/trends that impact on the prioritisation of activities.

Dropout

A student who withdraws before completing a course of instruction.

E-learning

Learning facilitated through the use of information and communication technologies. There are several facets to eLearning including hardware (computers, mobile phones, digital cameras, etc.), digital resources (the Web, materials presented via Virtual Learning Environments, online libraries, etc.), software (tutorials, 'office' packages, etc.), and online communication tools (email, chat, forums etc.).

ECTS (European Credit Transfer System)

European Credit Transfer System: A transferable and transparent credit-based system for higher education courses enabling students to move universities and have past credit-bearing courses recognised.

Enablers

The structures and mechanisms used to respond effectively to institutional drivers.

Entrepreneurship

The act of setting up and managing a business venture along with any risks in the hope of making a profit. It is also perceived as a universal set of skills and attitudes that can be applied to undertakings in every context – new business, company project or social venture.

Equity capital

The part of the share capital of a company owned by ordinary shareholders. The value of equity capital is calculated by estimating the current market value of everything owned by the company from which the total of all liabilities is subtracted. On the balance sheet of the company, equity capital is listed as stockholders' equity or owners' equity.

Evaluation

The act of systematically determining the importance, effectiveness or value of something.

Flipping

A teaching approach that 'flips' the use of the classroom. This is usually accomplished by moving direct instruction online; for example, through the use of videos which students study at home, and using classroom time for interactivity, for example group work or discussion.

Formal education

A form of learning delivered by trained teachers in a systemic intentional way within a school, college, university or other educational institution.

Freemium

A business model in which a basic service or product is available to users for free, but additional services and features must be paid for. A well-known example of a freemium business model is Skype, which provides free computer-to-computer calling and sells premium products in the form of voicemail, conference calls and worldwide connection to landlines and mobile phones.

GCI

The Global Competitiveness Index integrates the macro-economic and the micro-business aspects of competitiveness into a single index, which is made up of over 110 variables, structured in a framework and a corresponding set of indicators in three principal domains (pillars) and twelve sub-domains.

The Global Competitiveness Report is a comprehensive assessment of countries' economic competitiveness.

HEI

Higher Education Institution (HEI) is an establishment providing higher education and recognised by the competent authorities as belonging to its system of higher education.

Higher education

Degree-level education provided at universities or similar educational institutions. It encompasses all types of courses of study, or sets of courses (programmes), training, or training for research at the post-secondary level which are recognised by the relevant authorities as belonging to its higher education system.

Informal learning

A form of learning (often self-directed) that has no set objective in terms of learning outcomes.

Innovation

A new idea, product, or method or a change that creates a new dimension of performance.

innovation is often also viewed as the application of better solutions that meet new requirements, unarticulated needs, or existing market needs.

Instructional

Designed to teach someone how to do something.

Intercultural

Relating to or involving more than one culture.

Interculturalization

A basic concept of today's society and a process through which an organisation changes its behaviour to become culturally neutral.

Interoperability

The degree to which products, programs, etc. can be used together, or the quality of being able to be used together.

Intrapreneurship

The act of behaving like an entrepreneur while working within a large organisation.

Key skills

The essential skills which people need in order to be effective members of a modern society and a flexible, adaptable and competitive workforce. Examples of key skills are communication, collaboration and group working, literacy, numeracy, use of information technology and knowing how to learn.

LMS

A Learning Management System is a software application used to plan, implement and access learning content. An LMS can register users, track courses in a catalogue, record data from learners, and provide reports to management.

Learner-centred

A method of teaching that shifts the focus of instruction from the teacher to the student.

Learning analytics

The measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimising learning and the environments in which it occurs.

Learning outcomes

The specific intellectual and practical skills gained and tested by the successful completion of a unit, course or whole programme of study. They take the form of statements which indicate what a learner should have achieved in respect of both knowledge and skills at the end of a given course or programme.

Learning platform

An integrated set of online services that provides teachers and learners with the information, tools and resources to support learning.

Learning to learn

The ability to pursue and organise one's own learning, either individually or in groups, in accordance with one's own needs, and awareness of methods and opportunities.

Licensing

The process of giving or getting permission to have, produce, or use something that another person or company has created or owns.

Lifelong learning

All learning activity undertaken throughout a person's lifetime, with the aim of improving knowledge, skills and competence, within a personal, civic, social and/or employment related perspective.

MOOC

A massive, open, online course designed for large numbers of participants that can be accessed by anyone anywhere as long as they have an Internet connection, are typically open to everyone without entry qualifications and offer a full/complete course experience online, for free.

MOOC platform

An institution or organisation that creates and publishes a MOOC. In many cases these are HEIs, but MOOCs are also offered by various agencies, social enterprises and organisations.

MOOC provider

An institution or organisation that creates and publishes a MOOC. In many cases these are HEIs, but MOOCs are also offered by various agencies, social enterprises and organisations.

Non-formal education

A collective term for all forms of learning and education which happens in all fields outside of formal educational systems.

Non-formal learning

A collective term for all forms of learning and education which happens in all fields outside of formal educational systems.

OCW

Open Course Ware: course materials created by an educational institution and published online for free, and under an open licence.

OER

Open Educational Resources (OER) are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property licence that permits their free use and repurposing by others.

Off campus

To be away from a university or college campus.

On campus

To attend lectures, tutorials and participate in other activities located on a university or college campus.

Online course

A course that is available to learners online. For example, a course where most or all of the content is delivered online (>80% of content is delivered online); or all course activity is done online – there are no required face-to-face sessions within the course and no requirements for on-campus activity.

Online education

An umbrella term used to describe any education or training that occurs via the internet. In online education, learning is a result of online-facilitated experiences that are not constrained by time and/or distance. The label “online” applies to both the delivery of course material and the teacher-learner and learner-learner interactions.

Online learning

An umbrella term used to describe any education or training that occurs via the internet. In online education, learning is a result of online-facilitated experiences that are not constrained by time and/or distance. The label “online” applies to both the delivery of course material and the teacher-learner and learner-learner interactions.

Open Access

To be available to all. In the context of education it refers to broadening access of education

Open Course Ware

Course materials created by an educational institution and published online for free, and under an open licence.

Open Education

A collective term for the institutional practices and initiatives that broaden access to learning and training outside of traditional education systems.

Open Educational Resources (OER)

Open Educational Resources (OER) are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property licence that permits their free use and repurposing by others.

Open content

Creative or scholarly work that can be copied, modified and shared under an open licence.

Open licence

A type of licence that grants permissions beyond those offered by standard copyright law.

Open licensing

The use of open licences, a type of licence that grants permissions beyond those offered by standard copyright law.

Pedagogy

The science, method and practice of teaching & learning.

Peer

A person who is the same age or has the same social position or the same abilities as other people in a group.

Public domain

The state of belonging or being available to the public as a whole and not subject to copyright or legal restrictions.

QMS

A Quality Management System (QMS) is a formalised system that documents processes, procedures, and responsibilities for achieving quality policies and objectives. A QMS helps coordinate and direct an organisation's activities to meet customer and regulatory requirements and improve its effectiveness and efficiency on a continuous basis.

Qualification

An official completion of a course or programme of courses; any degree, diploma or other certificate issued by a competent authority attesting the successful completion of a higher education programme.

Quality assurance

The maintenance of a desired level of quality in a service or product. In education this implies the inclusion of the quality of teaching, resources, assessments, etc., as well as the quality of the institution.

Reciprocal teaching

An instructional activity in the form of a dialogue between teachers and students with the aim of collaborative construction of meaning.

Recognition

The act or process of recognising or being recognised. In education, this could be an acknowledgement of an achievement, such as course completion, by a competent authority.

Retention

The condition of retaining (keeping) something. In the context of MOOC this refers to the number of learners who continue to study a course rather than dropping out.

Self study

A way of learning by studying something by oneself.

Self-paced

A form of instruction that proceeds based on the learner's response; for example, a self-paced course enables a learner to start and finish as quickly or as slowly as they like.

Student-centred

A teaching approach that places the student at the centre. In learner-centred courses students construct their own learning from a rich environment, and share and communicate it with others; they should not simply focus on the transmission of content knowledge to the student.

Synchronous

Existing or occurring at the same time.

Unbundling

A process of breaking up education provision into smaller parts, which can then be offered at

a different scale and cost.

VLE

A virtual learning environment (VLE) is a system for delivering learning materials to learners via the web. The main components of a VLE system include curriculum mapping (breaking curriculum into sections that can be assigned and assessed), student tracking, online support for both teachers and students, electronic communication (e-mail, threaded discussions, chat), and links to external curriculum resources.

Validation

The process of officially ensuring that learning has taken place.

Verification

The process of establishing the accuracy or validity of something.

Virtual laboratory

An interactive environment for creating and conducting simulated experiments.

xMOOC

A MOOC which follows a traditional course structure. An xMOOC focuses on the transmission of knowledge didactically; i.e., it is fairly close to the classic pedagogical model used in lecture theatres. The designer of the MOOC predefines the learning objectives and how knowledge acquisition will occur. xMOOC are easier to implement at scale than cMOOC.