United Nations
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Cultural Organization

COMMONWEALTH of LEARNING

Making Sense of MOOCs

A Guide for Policy-Makers in Developing Countries

Mariana Patru and Venkataraman Balaji
Editors

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Foreword by the President and CEO, Commonwealth of Learning

COL's interest in massive open online courses (MOOCs) is rooted in its mission to increase access to quality education and training in an equitable and affordable manner. The MOOC has one distinction: it is the only scalable educational technology that was developed by and for educators. Nearly all other educational technologies, such as radio and TV, were adaptations of technology developments for other sectors.

There was another reason why COL took an interest in MOOCs. We have always believed that MOOCs were not the comprehensive packages they were made out to be in mainstream media. Various components of MOOCs could be re-engineered to suit the needs of learning for sustainable development. We have, over the last three years, partnered with various institutions to offer ten MOOCs for learners in developing countries. Our strategy in designing and managing these MOOCs has taken into account the rapidly evolving changes driven by a fusion of online technologies, social networks and mobile telephony. We have been successful in offering MOOCs to a wide range of learners, from research professionals to university students as well as to farmers and extension workers in local languages.

We recognise that most of the learners in developing countries have access to the Internet with relatively limited bandwidth, require offline access to learning materials and are not quite used to the online, peer-to-peer interactions that are taken for granted in the design and management of mainstream MOOCs. Much higher intensity of mentoring is required which is also not part of the standard design. COL and partners have developed a number of solutions that are partly technological and partly operational. COL has drawn upon its expertise and experience in open and distance learning to address the pedagogic requirements of dispersed and heterogeneous learners. The result is that we have a constituency of learners who not only are highly satisfied but also have performed well.

COL published a policy brief on MOOCs in 2015, which partly reflected a number of insights we gained from this experience. There have been several important developments even since then. One of them is the *Incheon Declaration*, which identifies MOOCs as an important instrument to support Member States in achieving the SDGs. It is for this reason that UNESCO and COL, long-standing partners in the field of education, have joined hands yet again, to bring out this *Guide for Policy-Makers in Developing Countries.* UNESCO has a wide network of academic experts that have conducted extensive investigations of MOOCs as a development in higher education. COL has carved out a niche for itself in MOOCs for development (MOOC4D) and has a network of institutional partners and practical researchers keen to harness MOOCs in support of mass outreach.

The synergies between UNESCO and COL are evident throughout this book, which covers a wide range of topics from working definitions to business models of MOOCs, from case

studies to concrete examples and from quality assurance to accreditation. Quality assurance underpins the entire discussion and is one of the strengths of this publication. In addition to guidance for policy-makers, this publication provides practical information for institutions that seek to launch MOOCs. The focus is of course on developing countries, where the need for mass participation in learning is intense and required resources scarce.

MOOCs are a very rapidly developing field, and they are inspiring innovations in assessments and credentialing. However, many times these tend to reach the well resourced and the well connected. We hope that this publication will inspire policy decisions and innovations that will also reach the last person in the queue.

Professor Asha Kanwar
President and CEO
Commonwealth of Learning

Foreword by the Assistant Director-General for Education, UNESCO

In September 2015, a new global agenda was adopted which puts education at the heart of achieving the Sustainable Development Goals (SDGs). Education was recognised as a stand-alone goal (SDG 4) to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." This new, ambitious goal reaffirmed the vision, principles and targets adopted in Incheon, Republic of Korea, in May 2015 to give a roadmap for education planners and practitioners for the next 15 years.

Member States, particularly developing ones, are aware that this new vision demands bold and innovative actions in order to reach this ambitious goal by 2030. There are many challenges ahead, one of them relating to information and communication technologies (ICT). Over the last decade, we have witnessed rapid technological developments. Their significant impact is being felt in all fields of human endeavour, particularly in education and economy. Powerful, ubiquitous and accessible technology, enabled by the Internet, has become an intrinsic part of our everyday lives, creating a multitude of opportunities for everybody to access good education and prepare for meaningful work and life.

However, not everyone is online. Globally some 4.2 billion unconnected people cannot yet take full advantage of the power of the online world. Developing and least developed countries need to constantly readjust their policies in search of long-term, effective and practical solutions. They also seek models and examples of good practice, which have the potential to guide them towards gradually overcoming existing challenges.

UNESCO and the Commonwealth of Learning (COL) have joined efforts once more to develop a new and timely publication, this Guide to massive open online courses (MOOCs), entitled *Making Sense of MOOCs: A Guide for Policy-Makers in Developing Countries*. This publication could not have come at a better moment, as countries around the world have embarked on the path of implementing their national plans to achieve the goals of the 2030 Agenda for Sustainable Development.

The aim of this Guide is to provide a strong case for governments in developing countries to be aware of the huge potential of online learning and MOOCs. Let me highlight a few of the benefits:

First, open and online education is seen as an innovation driver for improving education and as a basis for transforming secondary and higher education systems. In this respect, MOOCs are excellent for promoting lifelong learning. As courses offered free-of-charge to any number of people, anywhere and anytime, MOOCs enable access to higher education and beyond for people who cannot afford a formal education and are disadvantaged. In this respect, MOOCs may be regarded as contributing to the democratisation of higher education.

Second, MOOCs can reduce the disconnect between the skills and aptitudes of the majority of university graduates and the needs of the industry sector in many countries. This disconnect is triggering huge unemployment amongst youths and adults, particularly women.

MOOCs can be useful in providing job-oriented training and skills development, and we are already witnessing a number of policies and initiatives in certain emerging and developing countries strategically leveraging online learning, including MOOCs, for workforce development and upskilling programmes. However, issues related to credentials for MOOCs remain a challenge. This is an area demanding closer, multi-stakeholder collaboration, involving governments, higher education institutions and the private sector.

Third, MOOCs emerged from the open education movement. As such, they enable free access to high-quality content and resources, which might be too costly for higher education institutions in developing countries to produce. Use and reuse of MOOCs is therefore an important consideration in developing a national strategy. However, it is crucial to adapt such resources to various contexts.

Last but not least, the Guide emphasises two critical components for governments in developing countries to leverage the full potential of online learning and MOOCs: developing teachers' competencies to effectively use ICT; and embedding a robust quality culture in the design and delivery of online courses.

We hope that this publication will be useful for all countries considering the formulation of national policies and strategies to integrate MOOCs into their education and development plans.

I would like to thank the authors from the European Association of Distance Teaching Universities (EADTU), a recognised leader in online, open and flexible higher education, and all those who have contributed to making this publication a reality.

Dr Qian Tang
Assistant Director-General
for Education UNESCO

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Executive Summary

Over the past 20 years, higher education has undergone major transformations, brought about by: (i) increasing internationalisation and student mobility; (ii) an ever-growing demand for quality higher education and lifelong learning; (iii) changing student demographics; (iv) the rise of online and blended learning, (v) cross-border higher education and (vi) recognition and quality assurance of qualifications in a digital world without borders. At the same time, access to the Internet and broadband service has increased. According to the International Telecommunications Union, 43 per cent of the world's population is now online, with some form of regular access to the Internet, and the number of Internet users globally has reached 3.2 billion, of whom 2 billion are from developing countries (ITU, 2015). The huge growth in mobile connectivity, particularly in the developing world, has also brought online content and interaction to a global audience.

Since 2012, known as "The Year of the MOOC," massive open online courses (MOOCs) have expanded worldwide, shaking up the higher education landscape and potentially disrupting the model of brick-and-mortar universities. Whilst higher education institutions have long been engaged in the delivery of online content (via, for example open educational resources and virtual learning environments), the rapid advent of MOOCs is regarded by some experts as an education revolution — according to Class Central (Shah, 2015a), the total number of MOOCs reached 4,200 in 2015. However, most of the current MOOCs are delivered by top universities in the Global North, which many observers consider a one-way transfer of knowledge from the developed countries to the developing world.

The present UNESCO–COL Guide on MOOCs is designed to raise general awareness amongst policy-makers in developing countries as to how MOOCs might address their concerns and priorities, particularly in terms of access to affordable quality higher education and preparation of secondary school leavers for academic as well as vocational education and training. With very few exceptions, many of the reports on MOOCs already published do not refer to the interests and experiences of developing countries, although we are witnessing important initiatives in more and more countries around the world.

With due regard to the latest global developments concerning MOOCs, including enthusiastic and critical debates around them, this Guide seeks to highlight the potential of such courses to meet (however partially) some of the requirements of large-scale, effective training and supplementary (credit-oriented) learning in developing countries, maintaining an objective account of MOOCs rather than taking a position. It is hoped that after reading the Guide, policy-/decision-makers will be in a better position to understand the "MOOC phenomenon," capitalise on the advantages of these large-scale courses and use them as a strategic opportunity to help meet local needs and develop related capacities. Ultimately, this publication is designed to raise the awareness of policy-makers in terms of the potential

that online learning, including in the form of MOOCs, has for building new learning pathways towards tertiary education and for expanding lifelong learning opportunities.

Several global developments and initiatives have prepared the groundwork for such possibilities.

The open education movement. Education is about sharing. The OpenCourseWare programme, launched in 2002 by the Massachusetts Institute of Technology, has triggered a global movement in favour of opening up education, embodied by the development and adoption of open educational resources (OER). Countries and educational institutions around the world have formulated policies and launched initiatives in favour of developing, adapting, adopting and sharing quality online repositories with an open licence. With technology rapidly evolving, policy-makers and higher education institutions need to better assess ways in which MOOCs and OER could be effectively leveraged to improve access, enhance quality and potentially lower the cost of higher education.

Increased use of online and blended learning in higher education. In recent years, colleges and universities have been adding more online offerings to meet students' needs and expectations in terms of accessibility and affordability, as a means to accommodate their financial constraints and to help them balance family and workplace responsibilities. Online programmes are resources for students and working adults, who are increasingly seeking such programmes for degree completion and career advancement.

By integrating online and face-to-face approaches, blended learning provides learners with both flexibility and support. MOOCs are seen as an important tool to widen access to higher education for millions of people, including those in the developing world, as a means to ultimately enhance the quality of their lives.

Emerging and developing countries are already integrating and implementing MOOCs in their national and professional education initiatives. Available findings suggest that an increasing number of emerging and developing countries more frequently report benefits from online courses, including MOOCs, considering them an educational must and issuing national directives to strategically leverage them as effective tools for widening equitable access to quality higher education and for upskilling programmes. These courses, developed by leading universities, could be adapted and customised to meet individual students' needs in context-specific learning environments, as it is recognised that there is no one-size-fits-all approach.

More and more, MOOCs are seen as a medium for providing "relevant" job training courses to interested citizens who access them on the Internet. Available studies have emphasised the role of MOOCs as a viable channel to achieve greater equality for women in education and employment, particularly in jobs and industries where women are underrepresented. In addition to the achievement of SDG 4, they could also make an important contribution to SDG 5: *Achieve gender equality and empower all women and girls*.

The responsibility to deliver the right skills for the labour market must be shared between government agencies, academic and non-academic institutions, employers, and other concerned stakeholders. Governments should support and scale up multi-stakeholder partnerships for efficiency reasons but also for the benefit of society as a whole.

Promoting a culture of quality in higher education. Quality lies at the heart of higher education policies in all countries around the world. However, the demand for higher education is increasing well beyond the capacity of traditional institutions. Thanks to technology, teaching and learning are now less constrained by time and place. Online learning holds the potential of delivering quality education to anyone, anywhere. Many of the online self-paced courses offered outside of traditional higher education are of high quality, enabling learners' access to new knowledge, new skills and new professional opportunities. In a world of growing virtual mobility, and in an effort to address a more diverse range of learning options for working adults, more and more open and distance teaching universities have expressed their intention to promote the large-scale delivery of certified short learning programmes (SLP) and to incorporate MOOCs into these courses as flexible building blocks. Governments should develop or strengthen quality assurance frameworks for the recognition, validation and accreditation of flexible learning pathways as part of their broad development agenda.

Education 2030: A new vision for education. Education 2030 must be seen within the broader context of development today. MOOCs can contribute to SDG 4: *Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*. The *Education 2030 Framework for Action*, adopted at Incheon (Republic of Korea) in May 2015, recognises lifelong learning for all as one of the underpinning principles of this new vision, stating that "all age groups, including adults, should have opportunities to learn and continue learning." It also calls on countries to "develop policies and programmes for the provision of quality distance learning in tertiary education, with appropriate financing and use of technology, including the Internet, massive open online courses (MOOCs) and other modalities that meet accepted quality standards to improve access." MOOCs could be successfully designed and adapted to support the expansion of access to post-secondary education for all categories of learners and to maintain their motivation. They could also play a significant role in providing learning opportunities for those in fragile/emergency situations.

In response to these global developments, this Guide offers insights on a number of key issues surrounding MOOCs and their use in post-secondary education. Chapters 1 and 2 set the global stage, introducing the reader to the present-day challenges facing higher education systems around the world, particularly in developing countries, in terms of access, equity and quality. The place and role of online learning and MOOCs in the Education 2030 Agenda, as well as their implications for higher education and society at large, are highlighted. Chapter 3 looks at the possible benefits of MOOCs for developing countries, illustrated by a few concrete examples of MOOCs for development, whilst Chapter 4 tackles the key issues of quality assurance and quality criteria in MOOCs. Chapter 5 examines issues related to MOOC participants, including their motivations for and benefits from taking online courses, highlighting new pedagogies and principles for attracting diverse groups of learners. Chapters 6 and 7 look at more specific issues related to the development and (re)

use of MOOCs and at the need for collaboration at institutional, national and regional levels in this process, particularly directed at good government policies. The concluding Chapter 8 is devoted to the financial implications of developing MOOCs, proposing various business models, including for government involvement.

The Guide ends with an Appendix that proposes two different business model canvases for government involvement, a Glossary of key terms and concepts used, and a select list of References.

To conclude, perceptions of MOOCs are evolving. Given the rapid pace of change with regard to both higher education and technology, the authors are aware that no one can predict the evolution of MOOCs in the future, or the policy decisions that will have to be made. There are no "recipes" for success. Many aspects of an economic, social and cultural nature require further scrutiny. In implementing the new Education 2030 Agenda, governments are aware that cross-sector policies and plans should be developed or improved in order to address the social, economic and cultural barriers that deprive youths and adults of education and quality learning.

Whilst MOOCs may not be game-changers in higher education, their numbers continue to grow, calling into question the "business as usual" attitude of universities worldwide. There is also the underemphasised area of lifelong learning, which aims to target millions of adults outside of the higher education sector who are in need of new skills to advance livelihoods in rural and semi-urban contexts. Research on the usage of MOOCs in developing countries is still in its very early stages. However, it is hoped that this Guide will provide a strong case for governments in developing countries to perceive the benefits of online learning and MOOCs for their comprehensive policies and programmes to advance inclusive and quality education, as well as overall sustainable development goals.

Chapter 1:
MOOCs – Setting the Context

Policy takeaways

- MOOCs are a recent innovation in digital, online technology, at the intersection of open education and online education, and can serve to advance both.
- They have the potential to increase access to quality higher education while bringing down costs, especially in the context of developing countries.
- MOOCs can also be delivered to increase participation in lifelong learning and training for very large numbers of people.
- To generate viable outcomes, the development and delivery of MOOCs are best operated as multi-stakeholder processes involving higher education institutions, governments and the private sector.

Introduction

Over the past 20 years, higher education (HE) has undergone major transformations, brought about by: (i) increasing internationalisation and student mobility; (ii) an ever-growing demand for quality higher education and lifelong learning; (iii) changing student demographics; (iv) the rise of online and blended learning, (v) cross-border higher education and (vi) recognition and quality assurance of qualifications in a digital world without borders. At the same time, access to the Internet and broadband service has increased. According to the International Telecommunications Union, 43 per cent of the world's population is now online, with some form of regular access to the Internet, and the number of Internet users globally has reached 3.2 billion, of whom 2 billion are from developing countries (ITU, 2015). The huge growth in mobile connectivity, particularly in the developing world, has also brought online content and interaction to a global audience.

In May 2015, in Incheon (Republic of Korea), the global community committed itself to a new vision for education, recognising the important role of education as a main driver of development and in achieving the other proposed Sustainable Development Goals (SDGs). This new vision, underpinned by bold and innovative actions, is fully captured by Goal 4, *Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*, and its corresponding targets. The *Incheon Declaration* and the related *Education 2030 Framework for A*ction (UNESCO, 2015) highlight the need for governments to develop policies and programmes for the provision of quality distance learning in tertiary education, making use of technology — including the Internet and MOOCs as well as other modalities that meet accepted quality standards — to improve access.

As a result of economic globalisation and the heightening of governments' awareness of the perceived links between education and economic competitiveness, a large number of countries have invested significantly in opening new HE institutions (HEIs) and boosting student enrolments (UNESCO, 2013). Several developing countries have also witnessed great expansion in student enrolments (UNESCO Institute for Statistics, 2010).

However, in spite of considerable progress having been made, access, equity and quality remain major challenges facing HE and policy-makers in developing countries in the 21st century. Increasing enrolments fuelled by massive demand for education, along with the rising costs of education and diminishing public budgets, have had a negative impact on quality. The demands on HEIs to adjust curricula and programmes in order to prepare graduates for lifelong learning and employment, in response to rapidly changing labour markets, plus rising student expectations in an increasingly competitive global HE market, all impact on the need to improve current instructional offerings. The advent of new technologies, enabled by the Internet, have opened up new possibilities and new ways for learners to access education anytime, anywhere, with lower costs, allowing them to earn whilst learning.

MOOCs are regarded by many as an important tool to widen access to HE for millions of people, including those in the developing world, and ultimately enhance their quality of life. They have generated a lot of discussion amongst educators, HEIs, government policy-makers and private companies. Indeed, no subject in educational technology in recent years has produced as much excitement and concern amongst the academic community as have MOOCs. The media coverage of MOOCs is huge when compared with the attention given to other educational innovations, creating interest in both private and public stakeholders and often resulting in serious investments.

MOOC definitions

The MOOC territory is very much a space of innovation and experimentation, and what is seen as a MOOC is still open to interpretation. MOOCs can be defined in many different ways. The Glossary at the end of this Guide presents a few of the proposed definitions.

These definitions do, however, have the following elements in common:

- **Massive**: designed for, in theory, an unlimited number of participants. This means that the course is designed such that the effort required to provide all services does not increase significantly as the number of participants increases.
- **Open**: access to the course is free, and there are no entry qualifications.
- **Online**: the full course is available through the Internet (using a laptop or desktop computer, a tablet computer or a smartphone).
- **Course**: the offering is a course, meaning that it offers a complete learning experience — i.e., it is structured around a set of learning goals in a defined area of study and includes the course materials, assessment tools such as quizzes, feedback, an examination and a certificate of completion.

MOOCs are online courses designed for large numbers of participants, can be accessed by anyone anywhere as long as they have an Internet connection, are open to everyone without entry qualifications and offer a full/complete course experience online for free (adapted from Mulder & Jansen, 2015).

It should be noted that whilst most MOOCs are offered at no charge, some are fee-paying (for which credentials might be available, as will be seen in Chapter 8).

MOOCs and open education

As described above, MOOCs can be seen as a form of open education offered for free through online platforms. The (initial) philosophy of MOOCs is to open up quality HE to a wider audience. As such, MOOCs are an important tool to achieve Goal 4 of the 2030 Agenda for Sustainable Development.

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. The Glossary contains references to several sources that define openness in relation to open education.

Instead of providing a definition, one could adopt the following statement about the 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.

To date, the main MOOC providers in developed countries generally attract only well-educated learners, who often already have several degrees and are employed (Macleod, Haywood, Woodgate, & Alkhatnai, 2015). It has been noted that participants with limited (online) study experience tend to struggle to complete MOOCs.

This Guide will demonstrate that the opportunities for learners in developing countries are real and achievable, but that MOOC delivery and organisation should be redesigned for that purpose.

MOOCs and online education

Digital technologies are contributing to the surge in openness as well as providing the necessary efficiency and scalability. With MOOCs, open education meets online education, and vice versa.

Online and blended education in general are seen by governments as a new and flexible way to educate at large scale whilst not increasing costs significantly (sometimes even increasing the quality of education whilst keeping total costs the same). As such, the educational innovation offered by digital technologies can solve some of the critical challenges of HE. In the context of MOOCs, with their massive dimension, the important digital innovation is related to the scalability of many educational services.

It is important to recognise that online education is not the same as open education. As with MOOCs and open education, it is hard to find a broadly accepted definition of online education. The Glossary highlights some of the different interpretations of "online courses." In the context of MOOCs, an online course must be offered 100 per cent online. If it is not, then it is a blended or hybrid course. That said, there are examples of learners, for various reasons, participating partly offline and partly online. In a MOOC on mobiles for development (Porter, 2014), a set of learners in Sierra Leone and Zambia were provided with all the videos on DVDs and memory cards because bandwidth limitations prevented them from accessing streaming videos online. However, they participated in online discussions and quizzes. The COL-partnered mooKIT platform enables a learner to listen to the audio track of a talk on a mobile phone (to help in low-bandwidth situations) and is widely used; learners still participate in online discussions and exams. The key is that participation in a MOOC does not include the obligation to take part in a face-to-face setting.

As MOOCs offer a complete course experience, participants should always have the opportunity to receive, for free, a badge or a certificate of completion. But any formal certification (e.g., art of an accredited curriculum) can be seen as a separate process. Hence, a formal exam is not regarded as part of the MOOC itself but as a subsequent recognition of a relevant learning experience. The participant must always have the choice between receiving a free certificate through an online exam or paying for a formal examination (this is "openness" in the sense of having the freedom to choose). The latter may even require that the MOOC participant travel to an exam centre to secure authentication and authorisation.

In Chapter 2, the relationship between the promises of open and online education are discussed in more detail.

What is unique about a MOOC?

The uniqueness of a MOOC is related partly to its incorporation of both the open and the online components of education but mainly to its massive dimension. There is no precise number to define "massive," and it might even depend on characteristics such as the number of people speaking the language of the MOOC offered (Jansen, 2015). It is generally agreed that the number of participants is larger than can be taught in a "normal" campus classroom and that the design of the MOOC is scalable (designed for, in theory, an unlimited number of participants). Much has been written about the several types of MOOCs, but that level of detail is not the object of this Guide. The Glossary contains references to background articles on these discussions. In addition, Chapter 6 covers the different elements of which MOOCs consist.

How does a MOOC differ from an online course?

A MOOC differs from a "regular" online course in at least three aspects, outlined earlier in this chapter:

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

Scaling up or down along these aspects is possible, even based on the same system a MOOC uses. Doing so results in many alternatives in the form of online or blended courses, known under several acronyms:

- SPOC (small private online course)
- ROOC (regional open online course)

- TORQUE[1] (tiny, open-with-restrictions course focused on quality and effectiveness)
- SMOC (synchronous massive online course)

Some of these might even not be characterised as online courses, as they require classroom attendance on a campus. Note that these types of online courses can, in part, still be considered open because they remove some barriers to education, but they are not open to everyone. Nevertheless, they are still contributing to the opening of education for all by being designed for a large target group.

MOOCs and open educational resources

Open educational resources (OER) are generally described as online learning materials that can be Retained, Reused, Revised, Remixed and Redistributed for free (5Rs). One of the most internationally recognised definitions is contained in the 2012 Paris OER Declaration (UNESCO & COL, 2012):

> [OER are] teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions. Open licensing is built within the existing framework of intellectual property rights as defined by relevant international conventions and respects the authorship of the work.

Examples of teaching, learning and research materials are textbooks, syllabi, lecture notes, assignments, tests, projects, audio recordings, video recordings and animations. Another term frequently used in this context is open courseware (OCW), whereby all of the materials used in a course are published as OER.

The key issue here is that OER by themselves do not fully comprise education. Additional, complementary components are required. Important for now is that OER are only part of education and as such are just one element of a MOOC (i.e., only the learning materials). Along these same lines, OER do not comprise all aspects of open education — i.e., OER focus only on the removal of financial and legal barriers (by being free and openly licensed). Another distinct feature to retain is that learning materials in MOOCs can have an open or a closed licence. Although the definition of a MOOC does not require that the learning materials be OER, MOOC developers always have the option of making the learning materials available as OER. Moreover, (institutional) policy-makers may even set this as an important precondition for MOOC developers in the case of MOOCs developed with public money.

1 See http://www.let.ethz.ch/projekte/closed/Concept_TORQUE_ETHZ.pdf.

Chapter 2:

The Opportunities and Challenges of MOOCs for Societ

Policy takeaways

- There is a strong demand to meet the needs of businesses and industry for skills and HE. MOOCs can be useful in providing such job-oriented training; adaptation of delivery and certification processes will be required.
- The costs of tertiary education continue to increase because institutions tend to bundle too many services. With MOOCs, some of these services can be transferred to other suitable players in the public or private sector.
- MOOCs are highly scalable; when integrated suitably into policies related to youth development and social sectors, MOOCs can contribute to achieving the Sustainable Development Goals.

Introduction

Since 2012, when interest in MOOCs began to rise in HE circles, MOOCs have offered the promise of fundamentally transforming education. They continue to deliver an open challenge to all current methods in the HE system, including online learning, open education and distance education. Some, however, believe that the MOOC movement is a fad, and/or a good means of industrialising HE, and/or another manifestation of Western colonisation (e.g., Majhanovich, 2015), whilst others see it as a threat to traditional HEIs (e.g., Finkle & Masters, 2014). The reality is that recent media coverage of this phenomenon has shifted from MOOC providers and million-dollar investments towards more fundamental discussions related to strategic planning and the role of governments. The growth of open and online education is central to debates about the future of education, in which MOOCs will definitely play a role.

To this end, this chapter discusses the promises behind MOOCs in general, addresses the opportunities they offer for society, and also examines how they may impact society. It then explores the position of MOOCs in the broader educational movement and how these various innovations may respond to social challenges. The chapter concludes with a reflection on the role of governments in this wider picture.

What could or should be the role of governments?

By creating opportunities to improve the educational system, MOOCs are viewed as having important policy implications related to the future of education. For policy-makers and international organisations, the main interest in MOOCs lies in their perceived potential to enhance access to HE and lifelong learning by both improving the quality of education available (especially in developing countries) and providing HE at a cost greatly below that of conventional HE. Based on the present initiatives (NOU, 2014), the following reasons for governmental involvement 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 peer-to-peer learning, 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).

Whilst there is general awareness amongst policy-makers in developing countries of the potential of MOOCs to address broader social goals such as poverty alleviation and more equal access to educational opportunities for youths and adults, this possibility needs to become part of related policies and programmes.

The promises of MOOCs

MOOCs in essence have some unique characteristics that make them valuable for society.

- MOOCs are designed for massive participation — and indeed, the enrolment numbers are becoming massive. Class Central reported that in 2015, the total number of students who signed up for at least one MOOC crossed the 35 million mark, more than doubling the estimated 17 million for that year (Shah, 2015b).
- MOOCs provide a full course experience for free, increasing access to education for all kinds of (non-formal and formal) learners.
- Only an Internet connection is required to have access to quality education.

MOOCs thus can offer universal entry to high-quality education at no cost to the student.

How MOOCs may benefit society

Widening participation in higher education

It is critical to engage HE in the construction of a global vision and pathway for developing countries to achieve their overall Sustainable Development Goals by 2030. As societies move from being post-industrial information economies to knowledge economies, it should not come as a surprise that HE, as a knowledge producer, is a major force in the emerging global knowledge society. In an age of increasing ubiquity of information and knowledge, and through the ongoing expansion of MOOCs and OER initiatives, it has become easier for people anywhere in the world to acquire high-quality knowledge on demand.

MOOCs are gradually regarded as a way to address the growing number of individuals seeking to gain HE. Evidence points to rising numbers of learners signing up for "wholly online learning" as an indication that there is a real demand for such courses. Prospective students want to learn in their own time and at their own pace, and the Internet is allowing them to access learning opportunities online that previously were beyond their reach.

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.

Equality in and democratisation of education

MOOCs are considered a tremendous opportunity to provide groups of people, particularly those who cannot afford a formal education and are disadvantaged, with access to HE. 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 democratisation of HE, not only locally or regionally but globally as well. MOOCs can help democratise content and make knowledge reachable for everyone. Students are able to access complete courses offered by universities all over the world, something previously unattainable. With the availability of affordable technologies, MOOCs increase access to an extraordinary number of courses offered by world-renowned institutions and teachers.

The ROI of tertiary education for society

One of the big ideas presently in circulation is that MOOCs can contribute to the return on investment (ROI) of education. Learning is a highly valued good, as it is the driving force that enables the advancement of individuals and societies as well as economic, political and cultural development. Access to quality education offers citizens a better standard of life and the ability to engage more productively in all areas of human endeavour. Hence, it is highly advantageous for both individuals and society to invest in education. A high ratio of participation in tertiary education is especially beneficial for governments and society, since well-educated people present lower unemployment rates, live longer, have better health (thereby incurring lower health costs for society) and are more satisfied with life in general (Baum, Ma, & Payea, 2013).

The potential to reduce education costs

Education is a seven-trillion-dollar industry — 570 times greater than the online advertising market and seven times greater than the global mobile industry[2] — and the contribution of open and online education to this industry is rapidly increasing. The rise in digital education is the result of multiple factors, the main one being the booming business of education (Stansbury, 2014). The increasing market share of online education is related to the strong need for flexible, innovative learning approaches and delivery methods to improve the quality and relevance of HE.

In a white paper titled *MOOCs and Open Education: Implications for Higher Education*, the Centre for Educational Technology and Interoperability Standards states that stakeholders should "launch new market disruptions to target those who are not able to go to universities, or . . . launch up-market sustaining innovations by reducing the cost and providing better learning experiences without extra cost or low-end market disruptions to target those who look for simple and straightforward courses rather than complicated university degrees." (Yuan & Powell, 2013, p. 18)

The limitations of MOOCs for society

In spite of the benefits of MOOCs outlined earlier in this Guide, the role of MOOCs in education is contested terrain. In some quarters it is argued that MOOCs are not optimally inclusive and accessible to a wide and diverse range of citizens. Consequently, they cannot and must not be seen as the only solution for making quality education accessible to all, or for addressing other social challenges. They provide a possible valuable tool, but additional measures are needed, such as the formulation and development of comprehensive government policies to improve access to education that is adequately funded and based on social equity and inclusion, as well as other types of online or distance learning.

The claims that MOOCs already benefit society cannot yet be supported. Moreover, there is almost "no understanding of the private and social benefits of distance and online education in comparison with those of face-to-face education" (Rumble, 2014, p. 208). However, some studies (e.g., the COL projects described in Carr, Tenywa and Balasubramanian, 2015) indicate that informal distance learning combined with mobile phones does offer tangible social and economic benefits. Generally, though, there is an increasing need to better understand the public and private returns on investing in MOOCs and other new modes of teaching.

In contrast, it has been observed that MOOCs may not promote equality and the democratisation of education. Equity can be defined as reaching out to all who need or want to learn, taking into account their circumstances and competencies. But most MOOC participants today are well educated and have already had access to HE. In addition, to participate in a MOOC, one needs an Internet connection with good bandwidth, as well as digital skills. Further,

2 See https://www.knewton.com/infographics/the-state-of-digital-education-infographic/

some MOOC providers no longer offer all of their services for free; instead, they only grant free access to explore learning materials (Straumsheim, 2016). Access to the HE system (i.e., including recognition options) in these cases is therefore limited to those who can afford to pay for them.

Mulder and Jansen (2015) explored whether MOOCs can be instrumental in opening access to education. They concluded that MOOCs and their providers would not or probably cannot remove some barriers easily. Moreover, MOOCs themselves do create other barriers, such as network connectivity (learners need good Internet connection), digital literacy and, for now, cultural and linguistic barriers (as most MOOCs are still from Western countries and in English). Plus, not all MOOCs are formally linked to HE systems. Learning through MOOCs must be incorporated into formal programmes in order to really provide access at the system level. One warning relates to additional educational services that must be paid for (see Chapter 8); for example, the extra costs for gaining a formal credit recognised as a component in a full curriculum might even increase the total costs for a formal degree.

MOOCs as part of broader educational innovations

As stated above, MOOCs should not be seen as the big idea itself but rather as being in the service of big ideas. Essentially, MOOCs can contribute to SDG 4: *Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*. The *Education 2030 Framework for Action* refers to the role of technology in enabling OER and distance education, stating that tertiary education should be made progressively free, in line with existing international agreements (UNESCO, 2015, p. 14). However, OER contain only information and knowledge (see Chapter 1); they do not provide complete learning experiences in the way that courses do.

MOOCs are (or were originally) seen as the next step in the quest for greater access to quality education for all. As such, MOOCs can potentially contribute to many aspects of education. But a line of reasoning can be set up in which greater availability of MOOCs and other forms of open education can contribute to fulfilling many of the other Sustainable Development Goals:

- MOOCs as a means of achieving higher quality education by making more quality learning materials available.
- MOOCs as a means of training teachers, thereby increasing the quality of teachers and hence of education.
- MOOCs as a means to disseminate educational materials on subjects that can help with achieving other goals — e.g., learning materials to raise awareness about poverty (Goal 1), health and well-being (Goal 3), gender equality (Goal 5), decent work and economic growth (Goal 8), industry, innovation, infrastructure (Goal 9) or action on climate change (Goal 13).

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. In other words, from the point of view of developing countries, MOOCs should be considered another stage in the process of opening up and continuously improving education through the use of ICT. MOOCs have the characteristic advantages of any open and online education method. Nevertheless, they provide a specific group of benefits that should be emphasised.

The remainder of this chapter further explores the opportunities and challenges of MOOCs related to the promises of: (i) open education, (ii) online education and (iii) continuous innovation in education.

MOOCs as an instrument of open education — to educate all

MOOCs are part of the long history of university extension, open education and widening participation initiatives that have sought to extend access to (higher) education. MOOCs, and open education in general, are providing new learning opportunities for millions of people.

A brief history of open education: milestones in the open movement[3]

Correspondence/distance education (19th century)
Open University (1970)
OpenCourseWare (2001)
Open educational resources (2002), a term adopted at the first global OER Forum in Paris
The Cape Town Open Education Declaration (2008) emphasised a vision going beyond OER, which promoted a broader concept of open education
Open educational practices (OEPs)
MOOCs (2008 –…)
The Paris OER Declaration (UNESCO/COL, 2012) strengthened the focus on OER, calling on governments to openly license publicly funded educational materials
Porto Declaration on European MOOCs (2014)
Education 2030 (2015)

Chapter 1 explained that open education is primarily a goal associated with removing barriers to education. The aim is to increase access to and successful participation in formal and non-formal education by offering multiple ways of learning and sharing knowledge.

Discussions about openness in MOOCs are ongoing. In the previous chapter, we looked at the value of an openly licensed MOOC, which enables teachers to localise the MOOC for

3 For more on the history of open education, see http://www.openpraxis.org/index.php/OpenPraxis/article/view/23

their particular context. For now, it is sufficient to mention that openness in most MOOCs only applies to free access for everyone interested, which is different from openness in OER or other products, such as open source software.

Open access in scientific output has already proven to be sustainable and profitable for society. OER from the world's top universities have been available to everyone, free of charge, for over a decade. Open education must be seen as the next essential, integrated step, and MOOCs can play an important role in this. However, MOOCs are just one example of the broader field of open education.

MOOCs as an instrument of online education

Technology, particularly the Internet, has "transformed" how numerous sectors deliver their services. Now the question arises as to whether education can achieve similar results. The ongoing evolution of technology also introduces opportunities for opening up education by providing a range of online support services. In general, the term "technology-enhanced learning" is used to describe the positive impact that technology can have upon educational provision as well as how it can enable learners to access learning in new ways.

The Internet has become the showcase for educational institutions throughout the world, making it possible for them to provide information on their range of educational programmes and offer such programmes and courses (partly) online.

In online (and distance) education, learning is a result of online-facilitated experiences that are not constrained by time and/or distance. The label "online" applies to the delivery of course material as well as to teacher–learner and learner–learner interactions. Online (and distance) teaching institutions provide their students with access not only to materials but also to a range of support services both online and offline or face-to-face. Lowenthal, Wilson and Parrish (2009) showed that online learning is an evolving concept consisting of a wide variety of course designs and formats, going well beyond a one-size-fits-all learning model. Although MOOCs are the new kid on the block, we need to carefully consider their potential impact on the education sector, within the context of online learning.

Technology-driven innovation

Investments in these new and improved educational services are made through technology-driven innovation, which is often made possible by constant reductions in costs. ICT can significantly reduce both variable and fixed costs. Fixed costs are those that the organisation will incur regardless of its level of activity (e.g., the costs of hardware and software, the cost of time dedicated by academic and technical staff to developing and maintaining the course). Variable costs increase as the number of students increases; these include the time tutors spend on each student, and components such as the cost of bandwidth and the processing power that each course participant consumes.

In some situations, the variable costs are minimal and the difference between serving a small or a large number of customers is thus negligible. This phenomenon has been called "variable cost minimisation" (Kalman, 2014). ICT has created the possibility of large-scale education by bringing courses into the public domain, as is the case with OER (course content) and MOOCs (a complete learning experience). Online education is growing as a result of (i) the digitisation of educational content, (ii) mass distribution, (iii) personalised learning and (iv) cost reduction. For a university that offers MOOCs to the public, the difference between offering the course to 100 participants or to 10,000 participants is so small as to be insignificant.

Some, such as Christensen and colleagues (2011), have argued that one of the reasons for the escalating costs in tertiary education is the inefficient business model of tertiary provision. They have noted that universities typically bundle a range of services that include teaching, assessment, accreditation and student facilities as a package for all learners, whether they require them or not. MOOCs are opening up a discussion around the unbundling of such services and the possibility for universities to offer tertiary education, or elements of it, at a lower cost (Chapter 8 will elaborate on this topic).

MOOCs as a tool to improve education in general

Open and online education is seen as an innovation driver to improve education, and as a base for transforming secondary education and HE systems. MOOCs are in this respect excellent for promoting lifelong learning. They potentially offer a lot of flexibility for people who want to complete their training in a particular subject or who want to gain new knowledge in a specific area.

There is evidence of growing youth unemployment globally (Mourshed, Farrell, & Barton, 2012), with opinions expressed that educational institutions are not preparing young people for current job vacancies (Weise & Christensen, 2014). Both public and private employers often report mismatches and difficulties in finding the right people for their evolving needs. The value of work-based learning — notably of apprenticeships or "dual training" systems — in facilitating employment and increasing economic competitiveness is clearly recognised. In addition, there is a strong need for flexible, innovative learning approaches and delivery methods to improve the quality and relevance of HE. This is not just a matter of up-skilling individuals.

MOOCs can provide "relevant" job training courses to all citizens over the Internet. However, the responsibility to deliver the right skills for the labour market must be shared between businesses, educational providers and other stakeholders, including students. Such a multi-stakeholder approach could aim to supply citizens with the required 21st-century skills and to bring together representatives from the industry, education and government sectors.

The need for increased collaboration

The benefits of openness may be accrued by educational institutions, by the public(s) and state(s) they serve, and by third parties (commercial enterprises) or a combination of these. Up to now, open education has been driven by competition and demand. The economics of open and online education requires developing and delivering open products and services in partnership with others, regionally and globally. The world of open and online education does change the way we innovate our education system, programmes and courses. Investment in networked models (involving regional, national and corporate entities) is needed to promote open, flexible and online education for all.

Open, online education acts on transnational and global levels. It needs sustained collaborative efforts between educational institutions, civil society organisations, and companies. Co-operation should include diverse stakeholders involved, but present case studies show little involvement of all actors. Governments should support this kind of collaboration for efficiency reasons but also for the benefit of society as a whole. Chapter 7 will elaborate on possible collaborative models and the role governments can take.

Chapter 3:

The Possible Benefits of MOOCs for Developing Coun

Policy takeaways

- The generic model for MOOCs design and delivery needs to be re-engineered to take into account variations inside developing countries, such as limited Internet access, learner need for offline access, and levels of mentoring and learner support.
- Sector-specific strategies are necessary to harness MOOCs for skills development and capacity-building; generic approaches are not adequate.
- Governments, where possible, should adopt open licensing policies for content and software, to augment the effectiveness of using MOOCs in development.
- It is important to recognise the need for capacity-building amongst faculty in the management of MOOCs and to develop a system of recognition and incentives for faculty.

Introduction

The main challenge: access to quality lifelong learning

The problem of access to HE is frequently pointed out. The number of students enrolled in HE is forecast to rise from 99.4 million in 2000 to 414.2 million in 2030 — an increase of 314 per cent (Calderon, 2012). If an extra five years is added to these projections, the number of students pursuing HE by 2035 is likely to exceed 520 million. This growth is being fuelled by the transformations that we are witnessing in the developing and emerging regions and countries of the world, and it will only accelerate in the next decades (Calderon, 2012).

This anticipated boom in HE raises problems, as developing countries and emerging economies have a shortage of qualified teachers and a lack of high-quality learning materials. The picture is further complicated by wide-ranging factors such as financial constraints, lack of capacity, national priorities and the digital divide, rendering the scope of this problem very hard to grasp. The optimal solution would probably be to continue opening universities (employing both traditional and distance teaching), as well as to encourage universities to develop high-quality MOOCs. But in reality, options such as building more university campuses, bolstering online learning and removing barriers to learning barely scratch the surface of this enormous challenge (Johnson, Adams Becker, Estrada, & Freeman, 2014).

Hence, as was stated in Chapter 2, MOOCs are one possible instrument in tackling the social challenges of HE in developing countries, such as widening HE access and alleviating costs for disadvantaged youths and adults. Careful analysis is needed to identify the potential of MOOCs for opening up education.

Opening up education

Opening up education implies that an educational system is closed in some way(s). One, therefore, should define what element(s) of education should be opened and why. This may differ between continents, countries and collaborating institutions. In general, though, the following barriers exist (Mulder & Jansen, 2015):

- **Economics**: Financial barriers can hinder access to education. As MOOCs are delivered for free, cost is removed as an economic barrier.
- **Location**: Online provision guarantees that the learner no longer has to be in a particular place to participate in the course. In general, this does not apply to the formal examination.

- **Entry requirements** are removed as a formal barrier, since anybody can enter a MOOC. This does not necessarily imply that the course can be taken successfully without any prior competencies or experience.
- **Success in completion**: Educational success can be supported by using advanced pedagogies, in which context sensitivity is adopted.
- **Scheduling**: Self-paced courses enable participants to start anytime and choose their own schedule (freedom of time and pace). More and more, MOOCs are offered as self-paced courses.
- **Network connectivity**: Weak or no connectivity is a serious barrier to online provision as compared with on-site provision using printed books and other materials. This limitation applies in particular to countries in the Global South. To serve students from these countries, MOOCs need to consider offering suitable tools to deal with this challenge. Governments in developing countries need to put in place policies that facilitate higher Internet connections and, consequently, access to quality content.
- **Accessibility over time**: Some MOOC providers offer access to the course only for a limited time, typically between the course's start and end dates. Other MOOC providers ensure the contents of MOOCs are always accessible, even if they have fixed start and end dates during which they guarantee the availability of course content on the platform. A few providers offer unlimited access to both the content and the discussion forum of a MOOC.
- **Accessibility to all**: In principle, a MOOC offers a course to everyone with Internet access, including to people with disabilities. Occasionally, courses may exclude participants from certain parts of the world or apply an age limit. In addition, **language** and **digital literacy** barriers may hinder access.
- **Culture**: The issues encountered with OER are similar to the ones encountered with MOOCs. Cultural barriers will remain if courses are mainly developed within one dominant (Western) cultural perspective and ignore the cultural diversity of students. This has a negative impact on both the subject matter and the teaching method.
- **Legal**: Legal barriers with respect to the use of the course materials are removed completely only if educational materials are openly licensed.
- **Quality**: Quality barriers may be overcome by offering MOOCs. With an open licensing policy, the chances of raising quality are even better, as educators can revise and improve existing materials.

How might MOOCs serve various regions and countries?

A national strategy is necessary for governments in developing countries to leverage the full potential of online learning and MOOCs for education and development. The generic MOOC model will need to be re-engineered to allow for a broad spectrum of approaches and contexts, accounting for diverse languages, cultures, settings, pedagogies and technologies, and it should include possibilities for localisation. Openness is not simply a matter of barriers to access related to licences or technological aspects; it also has to do with inherent cultural, social and institutional challenges.

The importance of open-licensing policy

For MOOC participants, an open licensing policy might not seem that important. But having an abundance of quality educational resources available for free is essential for learners, as they are likely to benefit more from a richer learning materials space, which becomes possible if there are no legal barriers. Note that open licences can apply to different elements of MOOCs:

- the software used for the MOOC platform — i.e., open source, a term introduced in 1998, refers to the practice of giving free access to the source code of the software produced;
- scientific output used or produced in MOOCs — i.e., open access, a label referring to free access to cultural and scientific/scholarly outputs, in particular making these available free of charge online to all;
- creative output of MOOC participants — i.e., open content; and
- teaching and learning materials provided — i.e., OER.

An open-licensing policy on these MOOC elements is useful to address the cost aspects and the ability to localise the content.

What are MOOCs for development?

Developing countries in general, and lower-middle-income economies in particular, have a relatively small proportion of people enrolled in HE. The emerging knowledge society and the globalisation of trade and services have led to rethinking the contribution of HE to economic growth and development. Tertiary education is expected to accommodate a much higher proportion of the population in these economies who seek a university diploma or degree. There is also an urgency to achieve this increase in a span of a few years or at most a decade, rather than in a generation. The required infrastructure, human resources, capacity and investments may prove to be a tall order.

This is where MOOCs could serve the development needs of resource-poor countries. The scalability of the ICT infrastructure required to create and offer MOOCs makes it easier to achieve the necessary reach in a significantly shorter time compared to brick-and-mortar infrastructure and processes. It is also possible to work with available human resources whilst rapidly increasing reach. Thus, two critical requirements — faster pace and greater reach — can be achieved more easily by deploying MOOCs in support of tertiary education in developing countries. It is important to bear in mind that quality is of fundamental importance in sustaining the gains of increased reach with limited human resources and lower levels of financial capital.

MOOCs for development is a variation premised on the recognition of a few factors influencing online learning that are common to most developing countries. The important ones are:

- limitations on public ICT infrastructure;
- the relatively high costs of accessing higher bandwidth (such as broadband or 3G mobile);
- most teachers' unfamiliarity with offering online courses and mentoring online; and
- most learners' limited exposure to online socialisation in learning.

MOOCs can be meaningful when platforms and procedures are designed or adapted to offset the limitations imposed by these factors.

The Commonwealth of Learning (COL) has been engaged with partners in offering MOOCs for development since 2013. Over a period of 30 months, COL, the Indian Institute of Technology Kanpur (IITK) and other partners have offered a dozen MOOCs. One of them was specifically designed for the smaller, developing countries of the Pacific. Offered by the University of the South Pacific, this MOOC on climate change and Pacific Islands (http://www.uspmoocpaccc.org/) attracted thousands of learners, mostly from the developing countries in the region. To offset the relatively high cost of wired access, social media was integrated in the MOOC platform, enabling most learners to access discussions using their smartphones. This facility resulted in significantly higher rates of participation and certification.

COL also partnered with the AgMOOCs Consortium in India to offer six MOOCs that focused on agricultural subjects (see www.agmoocs.in). This initiative is significant because less than five per cent of the MOOC List entries (https://www.mooc-list.com/) focus on agriculture. Participation was significant, with most learners coming from either agricultural universities or extension agencies.

Notable was that intensive mentoring was necessary for the successful management of MOOCs for development. Fostering the formation of interest groups at a local level also contributes to their success. Carefully planned training of faculty and technical support staff prior to the launch of MOOCs was critical. Frequent and extensive consultations online and offline were carried out to identify relevant topics.

Policy implications

When topics are relevant, are likely to attract the interest of employers and/or can contribute to improved learning in degree-oriented courses, formal credit is less of a challenge for MOOCs. What is needed is a framework for quality assurance. The time investment by faculty in a typical MOOC in a developing country context is almost double that for a regular, on-campus course. This requires formal recognition, along with incentives. Unlike MOOCs offered by institutions in the OECD countries, a much higher level of mentoring is expected. Whilst it is known that online pedagogy is different from classroom pedagogy, there is insufficient consideration for the importance of approaching learning as a process that can be engineered. In other words, MOOCs for development must be based on a vision of learning engineering, and a certain amount of experimentation must be accepted as part of the initial investment. The MOOC management system at the institutional or country level needs to take into account some of these factors.

Chapter 4:
Quality Assurance for MOOCs

Policy takeaways

- A quality assurance framework is a critical component for a national MOOC strategy; such a framework does not yet exist for MOOCs, as they are a very recent development.
- Successful quality models exist for online education in some countries and can be carefully adopted for MOOCs.
- It is useful to build quality models for each component of a MOOC, such as identity management, pedagogy, assessment and credentialisation, and to expect conformance from every MOOC provider, including non-institutional players.

Introduction

Ossiannilsson and colleagues (2015) have formulated 11 recommendations regarding quality assurance (QA) for online education. The following (partially adapted) recommendations apply specifically to MOOCs:

- Build generic QA systems for online distance education, and apply them to MOOCs.
- Support QA audits and benchmarking exercises in the field of online open education.
- Use qualifications frameworks to address quality issues around credentialisation.
- Encourage, facilitate and support implementing QA related to MOOCs.
- Build QA for each of the multiple components in MOOCs (identity management, pedagogy, delivery, assessments and certification).
- Make these recommendations applicable to non-traditional MOOC providers as well.

What about the quality of a MOOC?

The *Incheon Declaration: Education 2030*, which embodies a new vision for education, reaffirms the commitment of governments across the world to promoting **quality lifelong learning opportunities for all**, in all settings and at all levels of education. With due attention to QA, this vision calls for the provision of flexible learning pathways, as well as for the recognition, validation and accreditation of the knowledge, skills and competencies acquired through non-formal and informal education. At the World Education Forum, in Incheon (Republic of Korea), the heads and members of delegations further committed to ensuring that all youths and adults, especially girls and women, achieve relevant and recognised functional literacy and numeracy proficiency levels and acquire life skills, and that ICT be harnessed to strengthen knowledge dissemination, information access, quality and effective learning. For MOOCs, QA should be constructed with the realisation of this vision in mind.

As for every form of education, considering the quality of MOOCs is essential to guarantee a worthwhile learning experience for the learner and at the same time reach the goals the institution has for offering a MOOC. However, the quality of MOOCs has been criticised from the start. The following are the most frequent complaints:

- The pedagogy of many MOOCs, resembling common lecture hall teaching, is poor (e.g., Margaryan, Bianco, & Littlejohn, 2015). However, increasing attention is being paid to developing more diverse pedagogies and effective learning modes. Downes (2013) has formulated four key success factors in this area: autonomy, diversity, openness and interactivity. Examples of other pedagogies with a more inclusive

and social approach can be found in cMOOCs (connectivist MOOCs; see Yeager, Hurley-Dasgupta, & Bliss, 2013).

- Most MOOCs have a low completion rate (see, e.g., Hollands & Tirthali, 2014). Taking completion rate as a measure for the quality of a MOOC has been criticised (e.g., Jordan, 2015); completion rate should be connected to learners' intentions, and not all learners intend to finish a MOOC.
- Although some argue that MOOCs have the potential to make high-quality education available for everyone, in reality, access seems mainly limited to a specific category of learners. Ho and colleagues (2015) analysed 76 MOOCs from Harvard and MIT, run in 2013 and 2014. They found that 71 per cent of participants had a bachelor's degree or higher, 31 per cent were female and 32 per cent were U.S. based. Schmid and colleagues (2015) confirmed that a majority of learners (69 per cent) originate from developed countries (see also O'Brien, 2015).

Hayes (2015) recently published a literature review on the quality of MOOCs. She argued that any discussion about the quality of MOOCs should always be connected to the aims of both the publisher of the MOOC and the learner. 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).

Ossiannilsson and colleagues (2015) have studied existing quality models for online education, including MOOCs, and in doing so have identified and analysed several dozen quality models worldwide. These models can serve one or more of the following aims:

- To be used for certification, defined as "a process of recognition by a non-statutory organisation such as a grouping of universities or membership organisation" (Ossiannilsson, Williams, Camilleri, & Brown, 2015, p. 28).
- As a basis for accreditation, defined as "a formal process of recognition or licensing operated by or on behalf of a regulating agency" (Ossiannilsson et al., 2015, p. 28).
- To be used for benchmarking purposes.
- To provide an advisory framework, e.g., guidelines to set up and maintain a QA process in an institution.

Regarding the quality of MOOCs, the authors observed that because of the relatively recent rise of MOOCs, users have two broad indicators of quality: the reputation of the MOOC platform provider and the reputation of the institution, based on its performance and standing in its mainstream teaching activities.

Learners have different goals when following a MOOC. These goals are reflected in their behaviour patterns when following the course. Hill (2013) has identified five categories of learners' behaviour in a MOOC:

- **No-shows**: register but never log in to the course whilst it is active.
- **Observers**: log in and may read content or browse discussions but do not take any form of assessment beyond pop-up quizzes embedded in videos.
- **Drop-ins**: perform some activity (watch videos, browse or participate in the discussion forum) for a select topic within the course but do not attempt to complete the entire course.
- **Passive participants**: view a course as content to consume. They may watch videos, take quizzes and/or read discussion forums but generally do not engage with the assignments.
- **Active participants**: fully intend to participate in the MOOC and take part in discussion forums, the majority of assignments and all quizzes and assessments.

A recent study by Wang and Baker (2015) has shown that participants who expected to finish a MOOC were more likely to do so than participants who did not think they would complete the course. This motivation in the category of "active participants" is a good predictor for completing a MOOC. Although this finding is in line with the findings of other studies, the authors concluded that further research is needed to gain more insight into the motivations of MOOC participants and how these relate to MOOC design, in order to provide a learning experience worthwhile for a large community of learners.

These studies highlight that QA for MOOCs has two aims:

- To assure that an institution's goals for publishing MOOCs are met.
- To assure that the goals of individual participants in a MOOC are met.

How do we determine the quality of a MOOC?

In a more generic way, two views on the concept of quality exist. Juran formulated quality in the first version of his *Quality Control Handbook*, in 1951, as "fitness for use" (see Juran, 1998). For a MOOC, this formulation assumes a group of users, each with their requirements and expectations of the MOOC and its use(s). We have seen that requirements and expectations can be very diverse, so from this perspective, "fitness for use" should address this diversity.

Crosby (1979) described quality as "conformance to requirements." For a MOOC, this means the requirements of the institution offering the MOOC and of the learners. This perspective assumes the existence of a set of requirements described in such a way that no misunderstanding is possible.

Both views may seem unrelated, but in reality they complement each other. The requirements and expectations of the learners are part of the information institutions consider when determining the relevant characteristics of the MOOC; this affects how the product parameters can be "fit for use." Feedback about the use of the MOOC helps to determine the extent to which the MOOC "conforms to the requirements."

Because a MOOC is a species in the broader field of online learning and education, criteria to measure the quality of a MOOC can be divided into several categories.

- **Criteria for learning in general**, not dependent on whether the material is offered offline or online or using a MOOC. For example, each course should include a clear statement of learning outcomes with respect to both knowledge and skills (Ubachs, Williams, Kear, & Rosewell, 2012).
- **Criteria specific to online learning.** For example, learning materials should be designed with an adequate level of interactivity so that students can engage and test their knowledge, understanding and skills at regular intervals (Ubachs et al., 2012).
- **Criteria specific to a MOOC.** These concern how specific aspects of learning using a MOOC are addressed:
  - the size of the MOOC, which limits student–teacher interactions
  - the motivation of participants to engage
  - culturally defined attitudes to learning

Although the last two criteria are not specific to MOOCs, they seem to be important for the success of a MOOC, perhaps more so than for other forms of online education.

Apart from these criteria derived from the fields of education and learning, there are also criteria to measure the quality of a MOOC in terms of a particular institution's requirements. Some of these requirements have to do with business policies (such as recruiting more students and increasing institutional visibility). Here, we will not go deeper into this issue but instead will focus on the educational quality of MOOCs.

Quality frameworks

Quality assurance, *qualifications framework* and *regulatory framework* are terms used somewhat interchangeably in the HE sector in many countries. QA is a matter of policy priority in HE in a number of developing countries. In this milieu, universities or similar institutions are founded through acts passed by national or provincial legislatures. Quality may not be legislated, but it is regarded as highly significant by experts and administrators within the educational domain. In many countries, expert agencies are authorised to oversee the quality of education (e.g., by the accreditation of institutions and programmes).

To make public investments in online learning, especially MOOCs, meaningful, it is necessary to build and sustain a QA framework. MOOCs have many specific components, such as learner identity management, pedagogy, assessment and certification. One approach is to create adequate and appropriate systems for QA for each one of these components. The systems may be constructed based on existing legal procedures, as has been generally done for distance education in several countries.

The remainder of this chapter will present two quality frameworks that could be used for QA in assessing a MOOC. These frameworks can be adopted by a national agency for accreditation purposes, or by an institution as a basis for the QA of online education in general — or, more specifically, for designing and running MOOCs. These types of frameworks have received wide support from national QA agencies for use in accreditation and evaluation, and from institutions for use as guidelines during the design and development of online education.

The E-xcellence framework

The *E-xcellence framework* was developed by the European Association of Distance Teaching Universities (EADTU) and has been described by Ubachs and colleagues (2012). It is an instrument for benchmarking the quality of online, open and flexible education at programme, faculty and institutional levels.

An institution or faculty can qualify for the *E-xcellence quality* label after a review with a positive result. The review determines whether a given programme is eligible for the label, based on aspects such as accessibility, flexibility, interactivity and personalisation.

The framework defines requirements (called "benchmarks") for the entire process, from curriculum design to delivery, including the management and support of online and blended learning. This is more generic than the design and publication of a MOOC; however, the *E-xcellence framework* can act as an umbrella for the assessment of MOOCs, although it does not take into account the specific characteristics of a MOOC. Other models (described later in this chapter) could be used for this purpose by merging MOOC-specific elements into the *E-xcellence framework*.

This framework is comprised of the following areas:

1. **Strategic management**, with benchmarks such as "having an e-learning strategy that is widely understood and integrated into the overall strategies for institutional development and quality improvement."
2. **Curriculum design**, with benchmarks such as "curricula using e-learning components offer personalisation and a flexible path for the learner, whilst ensuring the achievement of learning outcomes" and "learning outcomes are assessed using a balance of formative and summative assessment appropriate to the curriculum design."
3. **Course design**, with benchmarks such as "each course includes a clear statement of learning outcomes in respect of both knowledge and skills. There is reasoned coherence between learning outcomes, the strategy for use of e-learning, the scope of the learning materials and the assessment methods used."
4. **Course delivery**, with benchmarks such as "e-learning systems provide a choice of online tools which are appropriate for the educational models adopted and for the requirements of students and educators."
5. **Staff support**, with benchmarks such as "adequate support and resources (e.g., technical help desk and administrative support) are available to academic staff, including any affiliated tutors/mentors."

6. **Student support**, with benchmarks such as "students are provided with clear and up-to-date information about their courses, including learning and assessment methods."

The OpenupEd quality label

This label is derived from the *E-xcellence framework* and has been described by Rosewell and Jansen (2014). Ossiannilsson and colleagues (2015) identified this framework as useful for certification and benchmarking. Although the label describes a self-assessment and review QA process for the MOOCs in the European OpenupEd partnership (see www.openuped.eu), the *OpenupEd framework* can be used for the QA of any MOOC. The benchmarks statements in this label, derived from benchmarks produced by the *E-xcellence framework*, are divided into two groups: those that apply at the institutional level and those for individual courses (MOOCs). The benchmarks for the institutional level are grouped into the same six areas as the E-xcellence benchmarks. Table 4.1 shows the framework at both levels (institutional and course), comprised of the frameworks in Ubachs et al. (2012) and Rosewell and Jansen (2014). For the institutional level, the examples (when appropriate) are derived from those provided as examples in the *E-xcellence framework* in the previous paragraph.

Table 4.1: Framework for the OpenupEd Quality Label

Institutional Level	
Area	Example of a benchmark
Strategic management	The institution has a MOOC strategy that relates to its overarching strategies for eLearning, 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 presentation of MOOCs to support consistency across the portfolio. These templates have 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 educational models adopted.
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 aims/objectives, learning and assessment methods, workload and prerequisite knowledge.

Course Level
A clear statement of learning outcomes in terms of both knowledge and skills is provided.
There is reasoned coherence between learning outcomes, course content, teaching and learning strategies (including the use of media), and assessment methods.
Course activities aid students in constructing their own learning and communicating it to others.
The course content is relevant, accurate and current.
Staff who write and deliver the course have the skills and experience to do so successfully.
Course components have an open licence and are correctly attributed. Reuse of material is supported by the appropriate choice of formats and standards.
The course conforms 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 and/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 using feedback from stakeholders.

To sum up, quality remains a major concern for all concerned stakeholders: HEIs, government agencies, students and MOOC providers. The successful uptake of online courses, including MOOCs, in developing countries largely depends on the development of effective quality assurance processes that are informed by explicit indicators and clear methodology to ensure the course quality and thus provide a meaningful learning experience to each and every learner.

Chapter 5:

Learner-centred Approaches and the Benefits for Learners

Policy takeaways

- It is important to invest in building the ICT skills of teachers as well as learners to increase participation in MOOCs.
- Similarly, investment in developing an affordable infrastructure for online learning and in improving teacher quality should also be a priority.
- HEIs and other MOOC providers should consider offering MOOCs on multiple access devices, including mobile phones, providing for translation features or automatic translation of the learning materials, thereby lowering the technological and linguistic barriers for learners in developing countries.

Introduction

Chapter 3 has already elaborated on the opportunities and challenges of MOOCs for developing countries. We will now focus on how the benefits can be accomplished through the design and functions of a MOOC and through policies (at the governmental and institutional levels). First, we will address the characteristics of learners in a MOOC, from either developed or developing countries. We will then elaborate on the benefits for learners and how policies could realise those benefits.

Participants in MOOCs

In 2015, more than 4,200 MOOCs were offered by several providers worldwide (Shah, 2015a). Almost 54 per cent came from edX and Coursera, the two largest MOOC providers (both based in the USA); 75 per cent of the MOOCs were in the English language.

In recent years, more and more non-Western MOOC providers have spread worldwide. MOOC List, the leading online global directory of MOOC providers around the world (www.MOOCs.com, 2016), contains 65 providers, including those from non-Western countries, such as: Brazil — UNESP Aberta (http://www.unesp.br/unespaberta) and Veduca (http://www.veduca.com.br/); China — Chinese MOOCs (http://www.chinesemooc.org/mobile/index.php), a MOOC platform launched by Alibaba and Peking University, and XuetangX (http://www.xuetangx.com/) launched by Tsinghua University; Indonesia — IndonesiaX (https://indonesiax.co.id/); Jordan — EDRAAK (https://www.edraak.org/en/); Malaysia — Malaysiamoocs (https://www.openlearning.com/malaysiamoocs); Russia — OpenEdu (https://openedu.ru/); and Saudi Arabia — Rwaq (https://www.rwaq.org/). NPTEL, in India, currently offers MOOCs in English (http://nptel.ac.in) using a customised platform.

Ho and colleagues (2015) presented results from their research on the characteristics of MOOC learners. They examined the 68 MOOCs offered by Harvard and MIT from Fall 2012 to Summer 2014 and identified the following learner characteristics:

- 71 per cent of the participants already had a bachelor's degree or higher.
- 53 per cent were under 30 years of age.
- 32 per cent were based in the United States.
- 31 per cent were female.

These results were in line with findings from other research. Christensen and colleagues (2013) found that about 16 per cent of participants in their study originated from developing countries. These participants possessed largely the same characteristics as those from developed countries (i.e., they were well educated, young and male). Findings from the same research also provided insights into learner motivation for participating in a MOOC. Table 5.1 list the results by region. Each respondent could select all motivations that applied, so the totals add up to over 100 per cent.

Table 5.1: Motivation to Take a MOOC, by Region

Region → Motivation ↓	USA (n = 11,933)	Non-U.S. OECD (n = 10,784)	BRICS (n = 5,151)	Other Developing Countries (n = 6,911)
Gain knowledge to get my degree	6.8%	12.1%	20.3%	20.9%
Gain specific skills to do my job better	37.0%	46.4%	47.7%	49.0%
Gain specific skills to get a new job	12.9%	16.9%	21.0%	21.3%
Curiosity, just for fun	55.5%	52.5%	43.7%	41.2%

Source: Christensen et al., 2013

These motivations reflect the possible benefits for learners in developing countries. Such benefits relate to general education, to lifelong learning and to skills acquisition for the labour market. We must realise, though, that these motivations were reported by learners with specific characteristics and do not necessarily reflect the motivations of learners who are not yet well educated.

Although research studies such as the ones cited above are scarce and have not targeted MOOC offerings from developing countries, they nonetheless reveal that the promise of MOOCs providing access to quality HE for all individuals worldwide is far from being realised. Franco Yáñez (2014) identified three major barriers to access:

1. Technological. MOOCs are designed to work on a computer with broadband Internet access, something to which, in many developing countries, less than a quarter of the general population has access.
2. Linguistic. Most MOOCs are provided in English, which not everybody in developing nations reads and/or speaks. This limits the access for people who are not sufficiently competent in a second language to take an online course.
3. Prior knowledge that the student must possess in order to grasp advanced concepts. Universities that offer MOOCs — with the aim of gaining greater visibility — are generally creating advanced courses related to cutting-edge technology or state-of-the-art knowledge (such as artificial intelligence or genetic engineering). Although theoretically not barred from access, most people who have not previously attended any sort of formal HE will simply not be equipped to understand the taught concepts.

Bonk and colleagues (2015) have identified the following concerns for MOOCs in developing countries:

- quality training of online educators
- models of MOOC design and implementation

- assessment strategies
- teaching practices
- inadequate motivation
- high attrition

These barriers to access could be lowered in several ways. Offering MOOCs on multiple platforms — including mobile phones and by providing translation features or automatic translation of the learning materials — could help reduce the technological and linguistic barriers. When resources are accessible under an open licence (as OER), translation by anyone is then permitted. However, translation is only one part of the language problem, as the language used in a learning resource also needs to be appropriate and accessible to audiences with low and moderate levels of education (Castillo, Lee, Zahra, & Wagner, 2015).

Several skills and features need to be in place for a learner to be successful in a MOOC: digital literacy, English language proficiency, a learning structure, an effective delivery environment, a perception of the value of learning, and critical literacies so as to evaluate large quantities of information (Liyanagunawardena, Williams, & Adams, 2013).

The following policy measures at both national and institutional levels could be taken to remove some of these barriers:

- providing an adequate infrastructure for online education;
- investing in improving teacher quality; and
- stimulating the development of the skills required to be successful in MOOCs.

However, policy measures alone are not sufficient to lower the barriers. MOOC design and pedagogical approaches also need attention. The next section elaborates on this point.

A learner-centred approach

There are several viewpoints on what pedagogy provides in terms of an effective learning experience. Bates (2015) presented an overview of the issues influencing what (if anything) constitutes an optimal pedagogy:

- Several theories on knowledge construction during learning, which influence the way teaching should be conducted (e.g., objectivism, behaviourism, cognitivism, constructivism, connectivism).
- Several opinions on whether the development of digital technologies has actually changed the nature of knowledge (e.g., knowledge as a commodity, the value of applied knowledge versus academic knowledge).

At the start of the MOOC movement, in 2012, a distinction generally was made between two types of MOOCs: xMOOCs (guided by an instructivist opinion on education) and cMOOCs (guided by a connectivist opinion on education). Nowadays, a lot of experimentation with

different pedagogies is being undertaken. In many cases, this leads to a new acronym to indicate the type of pedagogy used in the MOOC, and how the MOOC is organised. The Glossary provides some examples of these.

Clark (2013) identified eight types of MOOCs, dependent on the pedagogy used:

- **transferMOOCs**: transfer from teacher and course content to learner (mostly also named xMOOCs)
- **madeMOOCs**: more innovative ways of using videos, more challenging assignments, problem solving, peer work and peer assessment
- **synchMOOCs**: fixed start date, fixed deadlines for assignments and assessments, and a clear end date
- **asynchMOOCs**: no or frequent start dates, no or looser deadlines for assignments and assessments, and no final end date (also called "MOOCs on demand")
- **adaptiveMOOCs**: use adaptive algorithms to present personalised learning experiences based on dynamic assessment and data gathering on the course
- **groupMOOCs**: start with small, collaborative groups of students, with the aim of increasing student retention
- **connectivistMOOCs**: based on the connectivist opinion on education (mostly called cMOOCs)
- **miniMOOCs**: intense courses that last for hours or days instead of weeks

Specific MOOCs can belong to more than one of these categories (e.g., an on-demand xMOOC belongs to the categories of transferMOOCs and asynchMOOCs).

Guàrdia and colleagues (2013) formulated 10 principles for the design of a MOOC to attract a more diverse population of learners:

1. Use a competence-based design approach.
2. Realise learner empowerment.
3. Provide a learning plan and clear orientations.
4. Design for collaborative learning, including teamwork activities and discussion forums.
5. Support social networking.
6. Design for peer assistance.
7. Support knowledge creation and generation by the learners.
8. Provide opportunities for small group discussion and exchange.
9. Provide assessment and peer feedback.
10. Use media-technology-enhanced learning.

Although presented as design principles for a MOOC, these also could very well apply to the design of a broader range of education materials.

Chapter 6:

Reuse and Adaptation of MOOCs

Policy takeaways

- The design, development and delivery of a MOOC can be expensive for an institution; thus, reuse or adaptation of existing or available MOOCs is an important consideration in developing a national strategy.
- A certain amount of experimentation in matters such as pedagogy and platform design must be allowed, since MOOCs are a very recent innovation and are rapidly evolving.
- Continuous evaluation of MOOCs for effectiveness and impact is necessary, especially when MOOCs are harnessed in support of social and economic development.

Introduction

MOOCs are typically designed so that they can run with minimal academic support during the operational phase. The key issue in designing a MOOC is that it should enable large numbers of learners to participate through online technologies that avoid the need to meet in one physical location at the same time. These flexible technological and pedagogical practices have been available in some measure for decades but are now accessible to a greater range and number of users. However, the main new challenge with MOOCs is that the pedagogical model of the course should be such that the efforts of all educational services do not increase significantly as the number of participants increases. The scalability of those services, to ensure that access to and success in the courses is high, is the main design issue for MOOCs.

Consequently, participants should not be given the expectation of an amount of teacher presence similar to what they might expect in a formal and/or paid for (online) course. The operational efforts in the course rely heavily on the community and on technological scalability. Hence, all of the learning services — such as providing (automatic) feedback to each participant, tests and quizzes, the opportunity to earn certificates, and so forth — should be scalable. Also important is that the instructional workload of the academic staff on the payroll of the institution offering the course should not increase (significantly) with the number of participants.

These exigencies pose challenges for the development of MOOCs. To this end, the present chapter will discuss various models of MOOC development, highlight the consequences in their development process and elaborate on the opportunities for reusing (parts of) a MOOC.

Modes of MOOC development

Currently, several different scenarios are available for MOOC production and delivery:

- the national or centralised scenario (e.g., France Université Numérique, FUN);
- the industrial scenario, facilitated by private companies (e.g., Coursera, FutureLearn); and
- the collaborative–decentralised scenario, promoting diversity by embracing the strength of local–regional implementation (e.g., OpenupEd).

In the first two scenarios, a central MOOC platform is available for the development and delivery of MOOCs. Additional design and implementation services are offered to the academic staff of educational institutions. In the collaborative–decentralised scenario, institutions of regional hub partners have their own MOOC platform, and those partners share different scalable services in the development of MOOCs and in their uptake by society.

An essential element in the latter is the possibility of sharing and reusing all kinds of learning materials and tools. Open licensing policies are therefore crucial elements in the collaborative–decentralised scenario. However, such policies should be stimulated by all MOOC production and delivery scenarios. Currently, reuse and open licensing policies are implemented to a very limited extent, especially in the industrial realm. Some university professors are using MOOCs in a successful symbiosis with their traditional courses, embracing blended learning or the flipped classroom concept (Bruff, 2013). This has usually occurred when the course developers and tutors of the MOOCs were also the ones who had been teaching the traditional course (Ghadiri, Qayoumi, Junn, Hsu, & Sujitparapitaya, 2013).

Develop MOOCs iteratively

Because the design of educational interventions is typically carried out in an iterative cycle, this method is also recommended for the development of a MOOC. A design methodology can support this. An example is the ADDIE model, an educational development programme consisting of five phases: analysis, design, development, implementation and evaluation (Bates, 2015).

The development of a MOOC can occur iteratively between different runs of the MOOC, but one can also choose either a slower pace (improvement after a few MOOC runs) or a faster pace (improvement as part of the MOOC run itself). It is essential to start with analysing the context, conceptualising the design, and setting goals — determining why the MOOC is being developed and for whom (from a user's point of view and from the institutional and societal points of view). Then, the iteration cycle should be designed right from the start (including instruments for continuous analysis and evaluation).

This and other development cycles can be applied at different levels of granularity (e.g., learning activity, module, course or programme). For the learning design cycle as a whole, and at each level of granularity, there are common concepts for which services can be delivered to enhance and support the different development phases of MOOCs. The Larnaca Declaration on Learning Design (Dalziel et al., 2013) provides an excellent overview of these common concepts.

Producing different kinds of MOOCs

This section starts with a basic overview of different approaches to learning and different pedagogical MOOC models. Subsequently, it describes different types of MOOCs and their consequences for the process of developing courses.

Reflections on different pedagogical principles

In describing possible MOOC models, one might refer to the use of technology supporting *where* learning takes place (either in a classroom or online) and *by what means* learning is delivered (mobile, PC, books, etc.). However, when discussing the pedagogical models of

MOOCs, one generally refers to *how* participants learn. In this case, the important dimensions of learning are:

- chronology (i.e., synchronous and asynchronous intervention);
- the roles of learners and teachers in education;
- the different focuses, aims and directions of the learning (e.g., instructor-directed versus learner-directed);
- personalisation; and
- openness.

Classifications of pedagogies typically include three very general categories: cognitive-behaviourist, socio-constructivist and connectivist (Dron & Anderson, 2011). The xMOOC versus cMOOC debate is useful on a general level, but it is not particularly helpful on the micro level — that is, when determining how to structure learning activities to foster effective, efficient and enjoyable learning.

It is generally known that people learn by association, building ideas or skills step by step through active discovery and/or dialogue (e.g., social-constructive learning), and/or they learn by participating in (situated) practice (e.g., apprenticeship). All of these approaches emphasise the importance of (i) learner activity, (ii) the constructive alignment of activities with desired outcomes and (iii) feedback opportunities for consolidation (practice) and integration. However, they differ in the role and importance of other people, the authenticity of the learning activity, the formality of activity structures and sequences, the emphasis on retention/reproduction or reflection/internalisation, and the locus of control. A considerable amount of research is already available on these issues, based on decades of experience with distance education and eLearning (see Bates, 2015; Sloep, 2014).

The main discussions about developing MOOCs are related to different pedagogical principles. As such, development strategies and costs differ amongst these various MOOCs. This section deals only with the basic principles of developing xMOOCs and cMOOCs and consequently does not describe the pedagogical concepts at a micro level. Some other MOOC models will be highlighted possibly more relevant for open education (sMOOCs and open layers). Some basic knowledge about these different MOOC models is needed to understand the consequences for the development process and the level of reuse.

Producing xMOOCs

An xMOOC focuses upon the transmission of knowledge didactically — i.e., it is fairly close to the classic pedagogical model used in lecture halls. The designer of the MOOC predefines the learning objectives and how knowledge acquisition will occur.

In an xMOOC, learning materials are offered in small units that are easy to understand and process, usually 12–20 minutes long. Instead of readings, the main medium to transfer content and information is video. Other means are online tests, exercises and games. Short videos

and exercises follow each other, so that students have to practice what they have learnt. In addition, forums and wiki pages are used to give participants a social learning experience. With a forum, scalability is reached in the sense that during the run of a MOOC, the workload of teaching staff barely increases even when a lot of participants have joined.

Planning ahead is essential in this production process. In the pre-production phase, the video scenarios are written. These scripts should support the overall course, so the course design should be in place as well. The basic design rules of online education relating to the efficient choice of multimedia should be followed (Bates, 2015). In this context, experiments with low-cost video production are essential, especially to prioritise what kind of video will benefit most from professional production processes.

Producing cMOOCs

A cMOOC is a connectivist MOOC. This approach highlights the networked nature of the learning experience. 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. In this context, the iteration cycle of course design becomes more frequent and even decentralised, depending upon the level of granularity.

A cMOOC has similarities with the open movement in that both rely on community input (e.g., open content, open source software — see Chapter 2). In a connectivist course, actions and activities are optional; what is important, after all, is not (only) the course content, but the discussions and interactions between all participants. cMOOCs provide great opportunities for non-traditional forms of teaching approaches and learner-centred pedagogy whereby students learn from one another (Dron & Anderson, 2014). Development efforts are mainly in collecting resources and creating a vast amount of support for social interactions, both synchronous and asynchronous, in the same place and in different places.

Experiments with different kinds of MOOCs

In Europe, different kinds of MOOC models are emerging. One example, relevant for this Guide, is the social-seamless MOOC (sMOOC; see Brouns et al., 2014). The sMOOC model offers a differentiated and more holistic approach than other MOOCs. sMOOCs are designed to accommodate a wide spectrum of approaches and contexts, taking into account a variety of languages, cultures, settings, pedagogies and technologies. Consequently, the traditional pillars of open education theory are mixed with elements from socio-constructivism, gamification, ubiquitous learning and digital inclusion.

The following elements make up the sMOOC model:

- Besides the designed weekly activities/tasks, "challenges" are available. The general challenges are accessible in a centralised bank but may be localised and personalised.

- Participants receive "badges" when they complete special learning challenges.
- Contents and objectives are mostly structured under a story-like narrative.
- The sMOOC facilitates the construction of collaborative knowledge communities.
- Achievements encourage interactivity and engagement in the course.
- Social networking and Web 2.0 tools are incorporated to integrate the personal and professional experiences of participants. Participants have a personal page with access to the (learning) analytics for various courses.
- Digital literacy resources are integrated into the MOOCs and shared through different social networks.
- The professionals involved are trained in working with the various groups affected by the digital divide.

Presently, the sMOOC model uses a collaborative-decentralised scenario — i.e., each institution or hub-partner has its own MOOC platform, and each sMOOC is by definition multilingual (providing access in different languages) and offers the possibility of contextualised learning through mobile technologies and gamification.

The need for continuous evaluation

Irrespective of their type, MOOCs could be a useful tool for improving education and lifelong learning (see Chapter 2). MOOCs serve a certain aim, and their success or failure in doing so should be evaluated. For example, at an institutional level, the following processes should be evaluated on a regular basis:

- It is essential to examine the impact of MOOCs on the institution's present and potential customers.
- MOOCs influence an institution's processes and resources both positively and negatively. All these major influences should be evaluated.
- High-quality MOOCs require significant financial resources, while their financial benefits are subtler and tentative. These must be evaluated.
- The impact of MOOCs should be evaluated based on their business model, not on the business model of the given institution, which may have a significantly different one.

MOOCs are a significant innovation in (higher) education. Therefore, whether or not to develop them is a strategic decision for education institutions. The decision should involve not only experts from various parts of the HEI (e.g., technology, teaching, research, marketing) but also top decision-makers.

Moreover, MOOCs are not only an instrument for educational institutions — essentially, they are related to goals at a general societal level (e.g., increasing access to education), at a regional level (enhancing the circulation of knowledge relevant for local society), and at a

learner's level. Different evaluation schemes are needed for these different levels and should be part of the QA processes of MOOCs (see Chapter 4).

Different goals result in various MOOCs

Designing for different types of learners

In this regard, the example of open online course layers (Bang, Dalsgaard, Kjaer & O'Donovan, 2016) perfectly illustrates the importance of designing for specific target groups — i.e., one needs to know the preferences, limitations and other challenges of the target group for which one is developing a particular course. In a study of subpopulations of MOOC participants, Kizilcec, Piech and Schneider (2013) showed that MOOC participants can have very different objectives. The authors identified four prototypical types of learner engagement in MOOCs: completing, auditing, disengaging and sampling. Hill (2013) identified five categories of learner behaviour in a MOOC (see Chapter 4).

Course designers can use personas to represent typical learner groups. Learning analytics is an essential part in completing the connection between design and evaluation as part of the iterative cycle. Such research is starting to show how to use these data to improve courses so that they better fit a global audience of culturally diverse learners.

Designing for different institutional goals

On the next level, the design and delivery of the MOOC should align with the aims of the educational institution — i.e., the MOOC must contribute to the various institutional goals.

According to several U.S. and European studies (Allen & Seaman, 2015; Hollands & Tirthali, 2014; Yuan et al., 2014; Jansen et al., 2015), the predominant motivation for educational institutions to be involved in MOOCs is to increase institutional visibility and reputation. Typically, institutions that join one of the big MOOC platform providers view MOOCs as an opportunity to enhance their brand recognition and join an exclusive professional network.

These studies have also shown that a significant number of HEIs see MOOCs as an opportunity to experiment with innovative online pedagogical approaches (Allen & Seaman, 2015; Hollands & Tirthali, 2014).

In general, four clusters of objectives can be identified (Jansen et al., 2015):

1. Using MOOCs for financial reasons (e.g., reduce costs, generate additional income).
2. Using MOOCs for reputation/visibility reasons (e.g., student recruitment, marketing potential, reach new students).
3. Using MOOCs as an innovation area (e.g., improve quality of on-campus offerings, contribute to the transition to more flexible and online education, improve teaching).
4. Responding to the demands of learners and societies.

Most studies in the USA and Europe also agree that the objectives related to the financial (cost reduction, income generation) and scalability dimensions of MOOCs are *not* the most important objectives from the institutions' point of view.

There are no general guidelines and approaches for ascertaining how well a MOOC aligns with a given HEI's aims. Many of these institutions' aims for engaging with MOOCs are dependent on other factors, such as having good marketing, a reliable platform and staff who are ready to respond to learners' questions.

Research findings from developing countries (Warusavitarana, Dona, Piyathilake, Epitawela, & Edirisinghe, 2014) have highlighted that MOOCs are suitable for the development of HEIs in these countries, as they provide them with the opportunity to access the latest learning resources and most up-to-date developments in various subject areas. Academic staff indicated that the ability to take part in a new teaching approach has enabled them to rethink their course delivery and their engagement of students in collaborative learning environments. HEIs in the developing world should engage with MOOCs in order to build local capacity and enhance staff professional development.

Design, delivery and uptake by smaller countries/ universities

Smaller countries and universities have to think carefully about why and whether they should design or open up courses to the world. Language is an important issue, and in some cases, it may be more important to focus on learning opportunities at the national or local level.

To generate an idea of what sort of organisation is needed to produce a MOOC, Pomerol and colleagues (2015) provided a detailed overview of activities and stakeholders. As an example, the table below summarises the human resources estimated to produce an eight-week MOOC that corresponds to a teaching unit of eight hours of lectures per week.

Type of Human Resources	Estimated Time (h)
Teacher	312
Teaching support staff (e.g., instructional designer)	160
Technical support staff (graphic designers, webmasters, testers)	342
Project manager	n/a

Dix (2015) described a way to produce a MOOC with less effort and lower cost. MOOC development can be done alongside traditional classroom teaching, with MOOC materials being reused in traditional teaching via the "flipped learning" model.

Another important factor to reduce costs is the co-development of MOOCs with other institutions. Examples exist of in-country collaboration.[4] In addition, it may be possible to collaborate with knowledge institutions and civil society organisations in the development and uptake of MOOCs. Chapter 7 will elaborate on different collaboration models. Chapter 8 will describe in more detail the opportunities to reduce the costs of producing MOOCs, in light of different revenue models.

Reuse (elements of) MOOCs from other providers

Institutions can also reuse MOOCs. Three scenarios of such reuse in a formal setting are as follows.

Scenario 1: The students take a MOOC as part of a traditional course. Each week, the teacher organises a face-to-face meeting to discuss difficulties, add extra tasks, present local cases to supplement those in the MOOC and so forth. The final examination is prepared and graded by the teacher.

Scenario 2: The students take the MOOC independently from the institution. Two or three face-to-face meetings are organised to discuss problems. In the meantime, the students have to use the MOOC forum to solve problems they come across during studying. The final examination is prepared and graded by the teacher.

Scenario 3: The students take the MOOC independently from the institution. They have to use the MOOC forum to solve problems they come across during studying. The student takes the final examination as offered by the MOOC, in a controlled environment.

It is clear that the amount of teacher effort is highest in scenario 1 and lowest in scenario 3.

When the learning materials of a MOOC are published under an open licence, they can be reused and adapted without reusing the complete MOOC. Hence, in many cases such resources are available outside the MOOC platform, so access to them is easier and is not dependent on the availability of a particular platform — for example, videos may in many cases be uploaded to an independent video-sharing website.

To conclude, reuse of high-quality teaching and learning resources for online delivery brings benefits to lower-income countries, as it has the potential to cut costs, increase access and improve the quality of education.

4 One is the MOOC Biobased Economy, created by two regional universities of applied sciences in The Netherlands.

Chapter 7:
Collaboration on MOOC Development and Provision

Policy takeaways

- It is important to recognise that MOOC development and delivery are best carried out collaboratively, involving interdisciplinary teams across institutions and even countries. There should be adequate recognition and incentives for faculty and institutions to engage in the collaborative design and development of MOOCs.

- Besides open-licensing policies, governments could support the creation of regional or national centres to finance and promote MOOCs and allied activities.

Introduction

The development and uptake of MOOCs for education equality essentially needs contributions from many stakeholders, government as well as civil society organisations. The Lifelong Learning Platform (2016, p. 2) states that "tackling inequalities in education should be a part of the comprehensive fight for social justice, in order to make universal values alive particularly among young people."

Most MOOCs produced so far have been supply driven, i.e., born out of the enthusiasm of professors or entire departments for the subject they taught, leading them to offer it as a MOOC. We are now witnessing a trend towards a "demand-led approach," designing MOOCs in response to the requirements of particular groups in society who need to have more knowledge on a specific topic (Daniel, 2014). If MOOCs were designed differently, the research conclusions about the characteristics (and success rates) of different learners might be different as well. Consequently, conclusions about the failure to achieve quality education for all, about business models, and so forth are premature. Bringing social approaches and thinking to these design processes is essential to realise the potential benefits of open and online education. Design and development issues are important to demonstrate the real value of MOOCs. In addition, different collaboration schemes should be applied to maximise the uptake of MOOCs and to achieve efficiency in their design and development.

The need for collaboration: citizens' perspectives

People need the "possibilities of creating together and being creative together" (Mostmans, Vleugels, & Bannier, 2012, p. 105). This intercreativity enables the generation of new content collaboratively, as well as the use of digital technologies with autonomy and freedom (Meikle, 2002). The architecture of participation and co-creation/co-authorship is essential to make the development of intercreativity possible. MOOCs, by virtue of being designed for user contribution and having massive participation, are essential instruments: the greater the number of people in a network, the better the product created (O'Reilly, 2004). This confirms the importance of co-creation in driving intercreativity. MOOCs should take into account the design principles of participatory culture (Jenkins, 2009). Interculturality is an important quality: being creative in partnership with people outside one's culture and area of expertise builds community and understanding across cultures. It may also bring transformative changes when both cultures come into contact.

The need for cross-institutional and regional support centres

The following scenario focuses on the development of a national infrastructure for open knowledge resources, in which MOOCs are seen as part of the broader field of the open movement that includes open access, OER and open data.

At a centralised regional or national level, a support centre provides the services that are most effectively positioned across institutions. In some European countries (e.g., France, The Netherlands, Norway and Slovenia), such support centres already exist, generally focusing on those services that are most efficiently done in collaboration between institutions. At a society level, the following added values can be noted:

- Improved access (free of cost, licensed according to the 5Rs (Chapter 1)) to:
  - educational resources (OER, open textbooks, MOOCs)
  - scientific output (open access journals)
  - other knowledge resources
  - government data (open data)
- Reduced cost for the production and use/maintenance of knowledge resources
- Increased pace of innovation in the region (new enterprises, new skills)
- Creation of a national brand in the global market (many resources in the local language; open knowledge resources related to local culture and to the region's main industries; one strong, national offering in the global education market)

Collaboration in a cross-institutional/regional support centre should serve purposes in three customer segments, related to general societal goals:

1. Stimulate the pace of innovation in research centres, HEIs, knowledge providers, etc.
2. Enable all citizens in a given country to use knowledge resources, MOOCs, etc. for their own needs, skills, start-ups, regular businesses, and so forth.
3. Increase social mobility, equality, equity and social inclusion.

In this scenario, knowledge resources would mainly be produced within educational institutions (by teachers, professors, innovation projects at schools), research institutes and other knowledge institutions. Collaboration between these is essential in the production and maintenance of knowledge resources according to the 5Rs. Stakeholders would stimulate them to create their own localised MOOCs based on available content, tools and open MOOC platforms.

Next, these knowledge resources would be (re)used by citizens for their personal goals. Those goals might differ from educational purposes (both non-formal and formal), and the resources might be used to create new businesses. Citizens might also be motivated to

improve the available resources and/or to develop their own OER and MOOCs for relevant business purposes.

Special facilitation is necessary for citizens most in need, such as refugees, immigrants and the unemployed. These customers require additional services in their efforts to find jobs and improve their position in society. Such services are partly local, partly designed along new and flexible learning paths, and partly automated based on learning analytics tools (to stimulate non-formal learning).

The main key activities of these national support centres would be:

- Creating an up-to-date repository of local open knowledge resources in the country (including in regional languages).
- Providing support services to train people in the development and 5Rs of open knowledge resources. These would include offering services for the unemployed and stimulating entrepreneurship by the use of OER, etc. In addition, the support centre could act as a clearinghouse to handle copyright–copyleft issues for those developing open resources.
- Providing an open platform that facilitates collaboration, sharing, improvement, the aggregation of existing resources, quality review processes, and so forth.
- Marketing, dissemination, joint action to reach citizens.
- Exchange of good practices, open educational practices.
- Strengthening collaboration between citizens (open communities and networks) and between knowledge providers and/or HEIs.
- Evaluating the use of all facilities offered to customers.
- Securing the benefits for stakeholders.
- Researching the societal effects and benefits.
- Participating in OER research hubs.

More specifically related to MOOCs, these support centres could:

- Support the development of MOOCs by universities and other knowledge institutions.
- Offer a delivery platform for MOOCs, enabling universities to use new pedagogies in delivery when the existing platforms do not suffice (e.g., learning communities, large-scale tuition, new forms of assessment).
- Encourage the uptake of MOOCs by citizens.
- Stimulate the uptake of MOOCs by professionals and enterprises (knowledge transfer, innovation).

- Enable universities and teaching staff to develop, share and deliver MOOCs as well as blended and online teaching and learning in general.
- Foster institutional leadership in the educational sector, the professional development of staff, the sharing of new pedagogies and good practices, technology support, research and evaluation.

Key partners in this, aside from universities and knowledge/research institutions, are (i) civil society organisations, to act as bridges to citizens and thereby encourage the uptake of MOOCs and (ii) regional development organisations, cities and other public authorities, as well as professional training institutes and social partners promoting the uptake of MOOCs for innovation and development.

The role of government policies in facilitating support centres

Governments invest in tertiary education. In 2010, the OECD countries spent, on average, about 1.6 per cent of their GDP on tertiary education (OECD, 2014). The relative earnings for tertiary-educated adults in OECD countries are, on average, over 1.5 times higher than those of adults with an upper secondary education. More importantly, many studies demonstrate that learning is the main driver in fostering civic participation (International Association for the Evaluation of Educational Achievement, 2016).

MOOCs, as well as other forms of online and blended education, are seen by governments as a new and flexible way to educate the many and even to increase the quality of education while keeping total costs equal.

Opening up education cannot be successful without opening up policy. To accelerate this process, governments should support the development, delivery and use of MOOCs. This will involve:

- open licensing policy to ensure that all of the results and knowledge resources of publicly funded projects, educational organisations (from schools to HEIs), research institutes and governmental bodies are (increasingly) published in a central database, with an open licence;
- regional and national support centres to fund MOOCs and to support key activities for the development and delivery of MOOCs and their uptake by citizens and enterprises; and
- incentives for collaboration in the development, sharing and reuse of knowledge resources.

Focus on collaboration in open educational practices

Collaboration in open education has to do with any practice or policy by an institution/organisation that prompts:

- the exchange of open educational practices (OEPs) such as pedagogies, repositories, guidelines and training;
- formal or informal agreements to support OEPs; these can take place at different levels — intra-institutional, inter-institutional, national and/or cross-national; and
- the acceptance and recognition of learning achievements in open education curricula — for example, by issuing certificates and/or credits from third-party organisations.

In a broader perspective, OEPs relate to all possible barriers in education, but they also hold the potential to contribute to solving the latter:

- Rights and licensing (e.g., by applying policies that require the use of open licences for public-funded activities).
- Economic obstacles (MOOCs are an example of how to reduce the cost for participants and the cost of providing education to large numbers of people).
- Social and cultural aspects (e.g., by using different case studies that recognise diversity; by localising educational content for various target groups).
- Connectivity, including network connectivity (e.g., by making MOOCs available for download so that participants can study offline or use educational materials and activities that can be accessed with weak network connectivity).
- Completion rates — pedagogies that enhance completion rates are suitable for mass application and enable flexibility in learning paths.
- Accessibility, via policies that improve accessibility (e.g., open-door policies; access to ICT, including for people with disabilities; the World Wide Web Consortium).
- Equality and social mobility (e.g., by providing flexible pathways to HE for those potentially left behind; by using MOOCs as building blocks to complete degrees).

OEPs could be used not only as a starting point for inter-university partnerships but also to foster collaboration on:

- the production and exchange of free content and OER;
- open access research;
- the design and development of MOOCs;
- assessment and courses;
- the recognition of certificates and credits;
- the establishment of full open access courses and open access programmes;

- the development and use of open education technologies;
- the dissemination of OEPs;
- the adoption of open education policies;
- learning path advice for students;
- shared tutoring;
- shared open education administration (e.g., statistics, marketing, recruitment); and
- shared resources of all kinds (e.g., recording studios, assessment centres, libraries, laboratories).

Chapter 8:
Business Models for MOOCs

Policy takeaways

- There is no viable MOOC business model for the developing world as yet; higher education institutions in middle- and lower-income countries should adopt a business model that privileges local institutional capacity building over outsourcing.
- Gradual integration of MOOCs into mainstream higher education, including their use as supplementary courses, may pave the way for developing a financially sustainable business model.

Introduction

As already noted, OER provide only educational content for free (including an open licence). MOOCs are complete courses offered for free online, meaning that participants do not have to pay for a *full* course experience: all of the resources and most of the services in such a course (e.g., feedback, tests, quizzes, exam and some limited tutoring). However, this raises the question: Who is paying for the development of MOOCs and for all the operational costs?

To answer that question, we need to look at possible business models that describe the conceptual structure supporting 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 at a governmental level.

Currently, the main questions linked to MOOCs range from the sustainability of their business model to their ability to generate meaningful credentials for career-oriented or lifelong learners. This chapter will introduce the main principles behind the business models of MOOCs at different stakeholder levels. The Appendix of this Guide describes different interpretations of these business models and discusses in more detail different governmental business models related to MOOCs.

What are the general costs for a MOOC?

According to available research (Hollands & Tirthali, 2014), the costs for MOOC production and delivery range from nearly US$40,000 to over 325,000. In addition, approximately US$10,000–50,000 is needed to cover operational costs every time the course is offered. For example, it costs up to US$35,000 per course to record and publish lectures as part of an xMOOC. Tasks include recording (video, audio, screen capture, etc.), mixing, editing, post-processing and publishing, amongst others. In addition, there are the costs of the MOOC platform, including the support services offered (e.g., by the institution), or a membership fee for support by a regional MOOC provider or one of the global MOOC platforms.

These estimates are based on research of mainly U.S. institutions, offering their MOOCs via one of the main U.S.-based MOOC platforms. In general, though, it is agreed that more than 100 hours are needed for the development of a MOOC and that 8 to 10 hours per week are required for course management. Additional funds are needed to pay for the MOOC platform, the fee (annual or per MOOC) for a partnership with a MOOC provider, marketing and so forth.

The cost to develop a MOOC heavily depends upon the type of MOOC (e.g., sMOOC, xMOOC, cMOOC), the persons involved in the development process (e.g., instructors developing their own courses, team effort with the institution, team with the support of regional or global MOOC providers) and whether or not existing resources are reused (e.g., from a pre-existing on-campus course).

Experiments with different kinds of MOOCs and on other continents show that these costs can be reduced by:

- involving the target audience in the development (young people learning to code) and/or operation of the MOOC (peer-to-peer assessment, peer-to-peer tutoring, etc.);
- providing the MOOC on the institution's own platform rather than outsourcing it to one of the MOOC platforms;
- using open source software for MOOC platforms or using freely available social media tools on the Internet in network MOOCs (e.g., cMOOCs and sMOOC);
- using cost-efficient video recording tools;
- using existing material and OER, or even reusing complete MOOCs from other institutions; and
- using low-cost partnerships for those services that are scalable and best organised cross-institutionally.

MOOCs business models based on a freemium business model

According to Kalman (2014), it is hardly surprising that new business models based on the "free" concept are powerful and often disruptive. The freemium approach can be an effective business model, whereby a product or service is free to a large extent, but some users pay for additional services. The ability to freely play music from the Internet disrupted the business model of the highly profitable record labels of the 20th century. The business model of newspapers around the world was disrupted by the appearance of free daily newspapers, of free online news websites and of free or low-cost online alternatives to advertising in the classified ads section of a newspaper. In the last decade, we have witnessed an abundance of innovative, free online products. This abundance is a consequence of constant technological improvements.

The freemium business model is based on offering a satisfactory but limited basic product (e.g., limited in storage capacity, number of users, features) and charging customers for versions in which some or all of the limitations are removed. While often a large percentage of the users are satisfied with the free product, the income from the limited number of paying users is sufficient to cover the fixed costs as well as the minimal variable costs created by all of the users.

Freemium business models in education

Freemium business models in HE were generally introduced in the last decade. They are used in the following areas:

- **Open source and free software** describe software that is free for users (free software) and source code that is freely available (open software). In education, many open source software systems are available as learning management systems (e.g., Moodle). Presently, free/open software for MOOC platforms is becoming available (OpenMOOC, Open edX, mooKIT).
- **Open access journals** make published research results freely accessible to all. There are different models for achieving this. For example, in the "Gold route," the publisher charges the author(s) a fee to make the article available for free. This is in contrast with the "Green route," where the material is self-archived, or the "Platinum route," where no one is charged. Examples in education are the *Journal of Learning for Development* (JL4D), *Open Praxis* and the *International Review of Research in Open and Distributed Learning* (IRRODL).
- **Open textbooks**. An open textbook publisher allows educators to modify the free online version and sells additional services — for instance, the physical product — for a set price. Examples are OpenStax (a project run by Rice University's OpenStax College to improve student access to quality learning materials), the LATIn Project (a project addressing the high cost of textbooks for HE in Latin America) and Siyavula (a South African-based company committed to making high-quality OER available to every learner and teacher).
- **OER** started more than a decade ago with OCW initiatives that provided learning materials at no charge, as a public good. Business models around OER are still under development, looking for sustainable models beyond initial funding. Examples are Wikiwijs, MERLOT and OER Commons.

In all of these examples, the basic product is free for end-users, and an open licence allows modifications of the original source (see Chapter 2).

This "open family" has expanded in other areas, such as open data, open science, open innovation, open practices and open policies. Although criticised by some as not being (totally) open in relation to open licensing and other aspects of open education, MOOCs are seen as part of this open movement.

Many countries have adopted open policies at a national level (see Chapter 2 for examples). Open access publishing, for instance, is now the norm for many academics, not just those who might be deemed early adopters. This policy has extended to data from research projects as well as publications. Moreover, several governments are now developing strategies for open education, including policies on OER and MOOCs. This again highlights the social dimension of open education and the need for government involvement in MOOCs as well (see also Chapter 2).

The "unbundling" of higher education

As mentioned earlier in this Guide, universities typically bundle a range of services that include teaching, assessment, accreditation and student facilities as a package for 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 education process are offered by several providers, or that some parts are outsourced to specialised institutions and providers. Typical examples are support in the study choice process, study advice and tutoring, content development and content curation, examination training, assessment and proctoring, learning platforms and learning analytics services.

In this context, different educational services are split amongst different funding schemes and even different customer segments. Some educational services are outsourced to third parties for cost efficiency or to enable the organisation to restrict its activities to its core business matters. Freemium business models depend on the money that is generated by additional services to be paid for next to the basic product or service offered for free.

MOOCs are seen as an accelerator of this unbundling process when they involve the outsourcing of marketing efforts, ICT/delivery platforms, exams, learning analytics services and so forth.

This chapter provides an overview of these fee-based services at different business levels.

What are the possible revenues at a MOOC level?

One could argue that MOOCs themselves should generate additional revenue streams that compensate for the development and operational costs. All additional services that can be derived from the free MOOC offering can therefore be considered as possibilities.

Possible Additional Educational Services	**Explanation**
Formal certificates	As stated earlier, a MOOC should always include some kind of recognition, such as a badge or a certificate of completion, for free. In addition, MOOCs can offer the opportunity for participants to receive (for a small fee) a formal credit as a component of an accredited curriculum. When a MOOC and formal accreditation become two separate processes, they have been unbundled. It should be noted that formal accreditation requires additional costs in the form of authentication services and other resources.
Individual coaching/ tutoring during the MOOC	MOOCs are designed for mass participation, so tutoring is limited or automated. Some MOOC participants might want to pay for personal coaching, which may increase the success rate of the MOOC.

Possible Additional Educational Services	Explanation
Tailored courses for employees as part of company training (e.g., a SPOC based on a MOOC)	Companies might want to pay for additional academic activities for their employees, such as tutoring meetings, private classes, seminars and so forth. It is also possible to design courses based on a MOOC, tailored to specific target groups. Access to this kind of course would be restricted to a smaller number of participants.
Tailored follow-up resources based on participants' data in the MOOC	Most MOOCs use videos and documents to support the learning activities. These educational resources can be part of high-quality digital materials that go more deeply into the content of the MOOC. Consequently, a series of e-documents, software and e-books can be made available at a very small price for any participant who wants to delve further into the MOOC topic.
Remedial courses	"Remedial MOOCs" can be offered to students with or without special educational needs who want to achieve specific academic skills as compensatory or preparatory education. Money is generated by either connecting to formal certificate services (i.e., ensuring formal recognition) or offering institutions that specialise in compensatory and preparatory education the opportunity to pay for materials so that they can create MOOCs or SPOCs.
Training to qualify for access to universities	MOOCs can offer alternative courses to students who have been out of education for at least a year or have left school early. These courses are designed to give students the opportunity to develop academic skills, confidence and knowledge before applying to university. This again relates to money generated by certificates and/or tailored courses.

Source: Based on authors' work in EC-funded projects ECO, SCORE2020 and HOME

MOOC participants can pay for these additional services in such a way that the cost and benefits are balanced for each MOOC separately.

What are the possible revenues for a HE institution?

At this level, a HEI may invest in MOOCs in such a way that other benefits on the institutional level balance and/or justify the costs of MOOCs. In this context, the MOOC operation is connected to the business model on the institutional level. For this, we need to understand the reasons why some universities become involved in MOOCs while others do not.

The most commonly cited reasons for HEIs **not** yet being involved in MOOCs are:

- the high entry and annual fees charged by big MOOC platform providers;
- the cost to develop and maintain their own MOOC platform;
- the high costs of developing MOOCs — i.e., the economic viability of MOOCs;

- the effort and competencies needed to produce good-quality courses; and
- global competitiveness.

Regarding the last point, some critics state that MOOCs generate a level of global educational competition that hurts small versus large universities, as the latter have more resources, a wider audience and more brand weight. The quality argument also reinforces the perception of high costs and competitiveness. Only quality courses, with an obvious effort behind them, can survive in the MOOC environment.

According to many U.S. and European studies, the predominant motive for HEIs to be involved in MOOCs is to enhance institutional visibility and reputation. In addition, these institutions indicate that using MOOCs as an area for innovation (e.g., to improve the quality of on-campus offerings, contribute to the transition to more flexible and online education, improve teaching) and responding to learners' and societies' demands are important objectives as well. The same studies agree that objectives related to finance (exploring cost reduction, generating income) and the scalability dimension of MOOCs are not seen as very important. Consequently, the possible revenue streams for institutions also relate to these objectives.

Possible Added Value for Institutions	**Explanation**
MOOCs can offer a good marketing model	MOOCs create a lot of publicity and as such constitute a more efficient marketing tool than traditional courses.
MOOCs can attract better and/or more on-campus students	The main change resulting from this innovation has been the entry of new audiences or participants that until now were not interested in education/training or could not access it for various reasons — economics, geography, availability and/or prior knowledge (outreach to disadvantaged groups).
MOOCs can attract new kinds of students	MOOCs as useful tools for larger market targets — that is, not only on-campus students but also: students considering future career options; professionals needing updated, specific skills; people hoping for a career change; vocational learners, etc.
MOOCs provide innovation in educational provision	MOOCs are a source of educational innovation, providing a massive scale of access with wider interaction possibilities. Hence, instead of the traditional educational method of teacher–student interactions, in MOOCs platforms student–student interactions play a critical role in configuring the educational experience. In this way, institutions are developing new educational offerings by experimenting with MOOCs.
MOOCs result in scalable educational services	Related to the above, MOOCs are excellent tools to develop new, improved services that are scalable in different kinds of educational provision (new and existing).

Possible Added Value for Institutions	Explanation
MOOCs can improve the quality of on-campus education	In this mode, students' experiences with MOOCs are used to improve on-campus provision, by increasing the quality of regular courses (with new pedagogical approaches such as flipped classrooms using MOOC elements) and/or by increasing the success rates of on-campus students (students using MOOCs to prepare for exams).
MOOCs can reduce the costs of regular course provision	For some, due to their scalability, MOOCs might even reduce the costs of regular course provision. Using MOOCs for some tools and services might eventually lead to more cost-effective provision of on-campus education as well.
MOOCs can be a research area	The data generated within a MOOC have value for publications and consequently also for universities and researchers.
MOOCs can be mass environments for exploring research questions	One natural evolution of MOOCs is the transformation of educational tasks into research tasks, in a "learning by researching" process. MOOCs increasingly include research components that promote open online research instead of traditional coursework projects. Crowdsourced research through MOOCs is a potential development area to foster innovative collaboration forms between academics and citizens and promote new innovation models.

Source: Based on authors' work in EC-funded projects ECO, SCORE2020 and HOME

Business-to-business models

The business-to-business level is related to MOOC-platform providers and other providers of several kinds of educational services. Presently, HEIs pay these providers (sometimes supplemented by money from investors) for the services described in the following table.

Possible Added Value for Institutions	Explanation
MOOC platform	A MOOC platform essentially offers the digital environment for (most) education services required to publish and offer a MOOC.
Course aggregator	A course aggregator consists of a Web environment that performs tasks such as locating, classifying, labelling, indexing and evaluating MOOCs from multiple sources. Regional and global MOOC platform providers offer course catalogues to list all the MOOCs in their partnership. In addition, some global aggregators provide a total overview of MOOCs offered by many MOOC platform providers (e.g., Class Central) or try to offer a regional perspective (e.g., Open Education Europa).

Possible Added Value for Institutions	Explanation
Global marketing and increasing reputation	MOOC platform providers and other MOOC collaboration initiatives provide digital marketing services to increase the number of MOOC participants and/or increase the reputation of an institution worldwide. Branding and marketing services are a compatible combination to provide.
Learning analytics tools	Learning analytics tools make use of massive participation to collect and analyse data about learners and their contexts, with the objective of understanding and enhancing the learning process and outcomes, as well as the learning environment (platform, course design) in which these occur. Increasingly, these kinds of services are offered to platforms and/or institutions offering MOOCs.
Translation services	Translation services have been a cornerstone of the expansion of existing MOOC platforms. Some top MOOC organisations currently rely for their translations on collaborative platforms, where volunteers provide subtitles and other translation, as well as peer revision. Other parties offer applications of advanced technologies, such as machine learning and natural language processing.
Certification services	By definition, a MOOC offers some kind of certificate for free. However, additional, fee-based certification services are increasingly offered by either institutions or third parties. These services relate to more verified certificates (including authentication services and portfolio services for participants) and formal certificates (i.e., ones recognised as part of a regular bachelor's or master's programme).
Quality label for institutions/MOOCs	Existing platforms already provide their course partners with quality services for institutions and MOOCs. These are a necessary requirement to ensure end-user satisfaction. Some partnerships even have developed a distinct quality label for benchmarking institutional QA (e.g., the OpenupEd label).
Training in how to design/develop MOOCs	This includes consultancy services for training teachers in designing and developing a quality MOOC, as well as specialised courses for this purpose (which can be SPOCs or even MOOCs).
Using (anonymised) data for recruitment	MOOC participants can allow their MOOC provider to share their personal data and learning progress with interested employers. This service can be developed in any labour field. Employers are thereby assisted in locating the best people. In addition, this service can be used to address unemployment.

Source: Based on authors' work in EC-funded projects ECO, SCORE2020 and HOME

Most elements in this business-to-business model are related to the MOOC platform provider offering paid services to mainly HEIs. However, MOOC service providers are also seeking sustainable business models. As the market matures, it is essential for platforms to seek alternatives in order to ensure their viability.

Another business model for MOOCs is related to corporate training. This model focuses on the training or human resource development needs of corporations. The MOOC providers charge corporations according to the number of employees participating in the courses. This model also targets participants who would like to improve their skills. Corporations prefer these MOOCs to reduce the costs of human resource development.

Business models for government involvement

Alongside the different business models sketched above, some educational institutions receive funding from their governments or from various foundations. In general, these sources provide funding related to opening up education. Some governments have been funding MOOC initiatives or have even established national MOOC platforms (e.g., FUN, France; SWAYAM, India; OpenLearning, Malaysia; FutureLearn, UK) and open education initiatives. Some institutions and governments view MOOCs as effective investments for improving HE access, quality and affordability, and for addressing the needs of society.

One could ask why governments are willing to invest in MOOCs. Why should government policy-makers in developing countries be concerned with MOOCs? The answer is that without education, there is no development. In countries dominated by a market of expensive private colleges and universities, most people cannot afford to attend private HE, and public universities lack capacity. By embracing and supporting MOOCs, developing countries stand to win from the emerging massive pool of highly trained human capital, critical for their social and economic development. For this to happen, government, technology companies, the telecommunications industry and public universities should join forces to make high-quality online education for free a reality for everyone, using any available device, whether a mobile phone, laptop or tablet (Roberts, 2014).

While in developed countries, MOOCs may therefore be part of a general endeavour to maintain a competitive position in an expanding global market, for governments in developing countries, MOOCs can create opportunities to strengthen their education system and enhance access to HE.

In addition, the following arguments are used for government involvement in MOOCs and open education in general:

- MOOCs reduce the costs of HE at a state level.
- MOOCs facilitate equity, inclusion and social mobility by
  - reducing the cost of access to HE,
  - increasing access to opportunities, and

    - in some cases, being specially targeted at increasing social mobility and social inclusion.
- MOOCs can increase the pace of innovation in society.
- MOOCs can provide additional skills and jobs.
    - Governments and companies can invest in an infrastructure (at scale) enabling the basic skills needed in a 21st-century knowledge economy.
    - Teachers can further their professional development.
    - The unemployed can be trained.

Chapter 2 has already provided examples of these possible motivations for governments to stimulate the uptake of MOOCs and of open education in general.

There are different scenarios to realise the potential for MOOCs to contribute to quality education for all. These scenarios share the importance of the social dimension of education, which requires the involvement of governments. Related to this open education–social dimension of MOOCs, the European Association of Distance Teaching Universities (EADTU) has developed two different business model canvases for government involvement. One model is related to the open education–open resources dimension only. The second focuses on the use of MOOCs for all objectives of the educational system at a national level. Both models are summarised in the Appendix.

The establishment of a national support centre is essential in both business-to-government scenarios. National support centres for MOOCs and open/online education should be established with the following functions:

- to offer an open platform for MOOCs and open resources, enabling
    - maximum uptake by society, according to the 5Rs (see Chapter 2), and
    - universities to use new pedagogies for course delivery;
- to facilitate collaboration, sharing (the 5Rs), the improvement and aggregation of existing resources, quality review processes and so forth;
- to support the development of MOOCs by universities and other knowledge organisations;
- to provide support services to train people in the development and reuse (plus the other Rs) of open knowledge resources:
    - services for the unemployed
    - stimulation of entrepreneurship through the use of open resources
    - services that facilitate innovation in learning processes and continuing professional development (CPD)
    - new ways of recognition through skills acquisition and open learning
    - handling copyright–copyleft issues for those developing open resources

- to stimulate the uptake of MOOCs by citizens (open education), in close co-operation with civil society organisations;
- to strengthen collaboration between citizens (via open communities and networks), HEIs and other knowledge providers;
- to encourage the uptake of MOOCs by professionals and enterprises (to facilitate knowledge transfer and innovation);
- to develop institutional leadership in the sector;
- to support the professional development of staff;
- to contribute to sharing new pedagogies and good practices, technological support, research and evaluation;
- to secure benefits for stakeholders;
- to evaluate the use of facilities offered to society;
- to conduct research on societal impact and benefits; and
- to secure the efficiency of the national infrastructure and collaborate with other national support centres to ensure scalability.

The functions of a national support centre will differ significantly between countries and regions, based on local/regional needs, financial resources and possibilities for engaging with multiple partners.

Appendix: Examples of Government Business Model Canvases

About business models

The "business model" concept is a theoretical model like many other models used in science and industry; however, the word "business" in the term often confuses. Although the concept was developed in the context of for-profit businesses, it is now applied to any type of organisation, be it a for-profit, non-profit, governmental or any other kind of organisation. This broader "business" view will be discussed below. There are many versions of business models. Al-Debei and colleagues (2008) identified four primary dimensions, while Kalman (2014) included the following three components: (i) customer value proposition; (ii) infrastructure (both resources and processes); and (iii) finances.

Note that some argue that economic models cannot be applied to openly licensed and free resources such as OER and some aspects of MOOCs (Stacey, 2015b). Their argument is that classic economics is based on scarcity, whereas OER and MOOCs are based on abundance at no cost, so completely different approaches might be needed.

About the Business Model Canvas

Many templates are used to develop new, or to document existing, business models. The most popular one nowadays is the Business Model Canvas, which was initially proposed by Alexander Osterwalder (Osterwalder & Pigneur, 2010)[5] based on his earlier work on business model ontology (Osterwalder, 2004). Since then, new canvases for specific niches have appeared, such as the Lean Canvas[6] and the Open Business Model Canvas (Stacey, 2015a). The latter includes the elements of "Social Good" and "CC Licences,"[7] while the Lean Canvas is of particular interest for start-ups ("Business model canvas vs. lean canvas," n.d.).

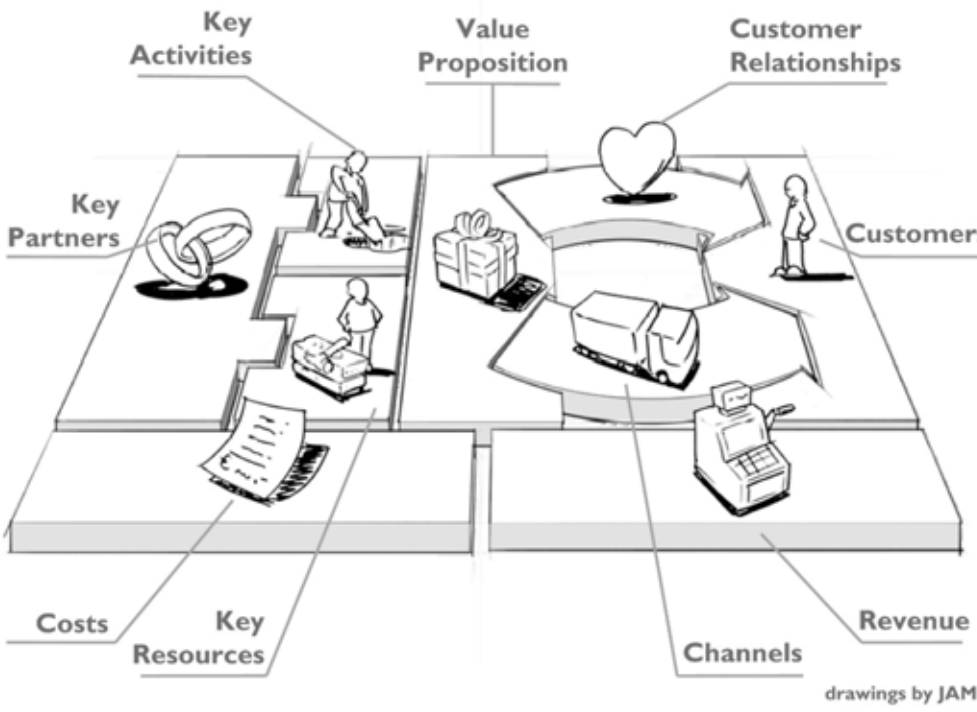
The canvas is actually a visual representation of the nine main elements of a business model to be discussed when establishing a business:

1. **Key partners**: To optimise operations and reduce the risks in a business model, organisations usually cultivate buyer–supplier relationships so they can focus on their core activity.
2. **Key activities**: The most important activities in executing a company's value proposition.
3. **Key resources**: The resources that are necessary to create value for the customer. These resources can be human, financial, physical and intellectual.

5 See also www.businessmodelgeneration.com.
6 See https://leanstack.com/lean-canvas.
7 See https://docs.google.com/drawings/d/1QOIDa2qak7wZSSOa4Wv6qVMO77IwkKHN7CYyq0wHivs/edit.

4. **Value proposition**: The value propositions may be (i) quantitative (price and efficiency) and/or (ii) qualitative (overall customer experience and outcome).
5. **Customer segments**: Various sets of customers can be segmented, based on their different needs and attributes, to ensure that corporate strategy is appropriately implemented to meet the characteristics of a given selected group of clients.
6. **Customer relationships**: To ensure the success of any businesses, companies must identify the type of relationship they want to create with their customer segments.
7. **Channels**: A business can deliver its value proposition to its targeted customers through different channels.
8. **Cost structure**: A description of the main costs to set up and maintain the business. This specifies business structures (cost-driven, value-driven) and cost structures (fixed costs, variable costs).
9. **Revenue streams**: The way a business generates income from each customer segment.

The following figure is a visual representation of these nine elements (Zebra Management Consulting, 2013):



On the next page, two different business model canvases are sketched based on the work of EADTU in this area. One model is related to the open education–open resources dimension only. The second focuses on the use of MOOCs in all objectives of the educational system at a national level.

Business Model Canvas for governments (1): A national infrastructure for open resources

In this scenario, the government involvement focuses on the development of a national infrastructure on open knowledge resources. Activities, platforms and services are funded by the governments and organisations that are part of the knowledge and education infrastructure. They serve a social mission, and the proposed structure is seen as an effective and efficient way to serve society. After initial transition costs, the revenues are related to cost reduction in the knowledge/education infrastructure and to society having more educated people, increased innovation and more new businesses.

<table>
<tr>
<td rowspan="2">Key Partners
▪ National government
▪ National support centre
▪ ICT service provider
▪ HEIs/knowledge providers
▪ NGOs and civil society
▪ Collaboration with other national centres
▪ Regional and global partners</td>
<td>Key Activities
▪ Inventory of national open resources
▪ Support services
▪ Open platform
▪ Marketing
▪ Exchange of OEPs
▪ Strengthen collaboration
▪ Evaluation and research</td>
<td rowspan="2">Value Proposition
▪ Improve access (free, 5Rs) to educational resources (OER, open textbooks, MOOCs), scientific output (open access journals), research and governmental data (open data)
▪ Reduce cost for the production and use of knowledge resources
▪ Increase the pace of innovation
▪ National brand in the global market
Channels
▪ Internet platform of service centre (e.g., national, Europe)
▪ Local communities
▪ Knowledge providers
▪ Training/ unemployment centres</td>
<td rowspan="2">Customer Relationships
▪ Collaboration in the production/ maintenance of knowledge resources
▪ Stimulated citizens in the (re)use and improvement of available resources
▪ Personalised and automated services for those in need</td>
<td rowspan="2">Customer Segments
▪ Research centres, HEIs, knowledge providers, etc. for innovation
▪ All citizens in the country, enabling them to use (5Rs) knowledge resources, MOOCs, etc. for their own needs and businesses
▪ Those needing jobs to increase social mobility, equality, equity, inclusion</td>
</tr>
<tr>
<td>Key Resources
▪ Open licensing policy
▪ Open sources
▪ Incentives for collaboration
▪ Services to society</td>
</tr>
<tr>
<td colspan="3">Cost Structure
▪ Platform, clearing house, free services for those in need
▪ Temporary: stimulate innovation and collaboration</td>
<td colspan="2">Revenue Streams
▪ Cost reduction in the knowledge/ education infrastructure
▪ More educated people, increased innovation, more new businesses</td>
</tr>
</table>

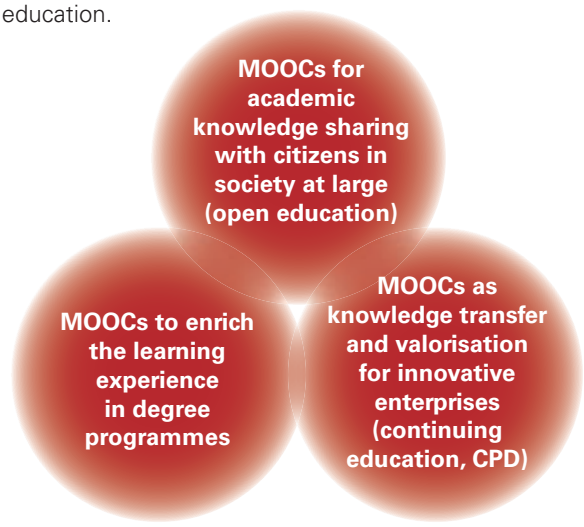
Business Model Canvas for governments (2): A national support centre for MOOCs

In this scenario, government involvement in MOOCs is related to maximising the spin-offs of MOOCs for research, innovation and education in universities — i.e., they contribute to education for all, to transferring and valorising innovative knowledge for enterprises (continuing education, CPD), and to formally or informally integrating MOOCs as an enriching learning experience in blended degree education (at the bachelor's, master's and doctorate levels).

<table>
<tr>
<td rowspan="2">Key Partners
▪ National support centres involving partners
▪ Civil society organisations, reaching out to citizens
▪ Regional development organisations, professional networks, reaching out to enterprises
▪ HEIs for the development and delivery of MOOCs</td>
<td>Key Activities
▪ Information and communication to civil society organisations and citizens (active marketing)
▪ Supporting the use of MOOCs for innovation in enterprises (collaboration with regional development organisations, professional networks; continuing education and CPD)
▪ Supporting the development and delivery of MOOCs, blended teaching and learning in degree education</td>
<td rowspan="2">Value Proposition
▪ Academic knowledge sharing with citizens in society at large
▪ Knowledge transfer and valorisation for innovative enterprises: continuing education and CPD involving MOOCs for innovation, regional development, business development
▪ Innovation in degree education (HEIs): enriched content, new modes of teaching and learning, blended degrees in HEIs
▪ International visibility, reputation of research, innovation, education</td>
<td>Customer Relationships
▪ Information and communication, user support
▪ Information and advice to professional networks, enterprises for innovation, knowledge transfer/valorisation
▪ Information, guidance for the development and delivery of MOOCs, integration of MOOCs in blended degree education</td>
<td rowspan="2">Customer Segments
▪ Citizens, civil society organisations
▪ Public and private enterprises, knowledge networks, professional networks
▪ HEIs: management, teaching staff</td>
</tr>
<tr>
<td>Key Resources
▪ MOOC platform
▪ National support centres, involving key partners
▪ HEIs: management, teaching staff
▪ Relationships with MOOC platforms</td>
<td>Channels
▪ MOOC platform, national support centres and civil society organisations to citizens
▪ MOOC platform, national support centres and regional development organisations to enterprises
▪ MOOC platforms, national support centres to HEIs</td>
</tr>
<tr>
<td colspan="3">Cost Structure
▪ National support centres
▪ Support outreach to citizens
▪ Support continuing education and CPD for innovation
▪ Support development and delivery of MOOCs by HEIs</td>
<td colspan="3">Revenue Streams
▪ Funding national support centre for MOOCs and blended/online education
▪ Funding outreach to citizens
▪ Project funding for MOOCs, continuing education and CPD
▪ Performance-based funding, earmarked funding, funding excellence in HEIs</td>
</tr>
</table>

The key objectives of governments concerning MOOCs can be related to:

- academic knowledge sharing with citizens in society at large: MOOCs as a means to deliver courses in the public domain; open education being accessible for free; the inclusion of all citizens able to follow a course;
- knowledge transfer and valorisation for innovative enterprises: MOOCs to promote continuing education and CPD; to provide education and training for innovation; to raise employability and professional expertise; to transfer and valorise knowledge for enterprises, enabling them to innovate;
- MOOCs to enrich the learning experience in degree programmes: to promote innovation in degree education; MOOCs as an experimental space for large-scale ICT-based education.



Whilst MOOCs mainly have been conceived as a form of open education (the first objective), from an educational policy perspective, all three of these objectives are important.

Although MOOCs are massive, one can question the massive uptake or usage of MOOCs at the national level, especially for open education, continuing education and CPD. There is still a long way to go in the take-up of MOOCs by new groups of learners and by people at work. Governments and institutions should involve other stakeholders to promote this, in particular civil society organisations, social partners, regions, cities and enterprises. Opening up education cannot be successful without an opening up of policy, embedded in society.

To accelerate this process, governments should support the development and delivery as well as the usage of MOOCs. Hence, partners are not only HEIs but also civil society organisations, regions and cities. This support should be rooted in a national policy regarding new modes of teaching and learning in mainstream degree education, open education, continuous education and CPD. This in turn requires the establishment of national support centres as agencies for bringing together all stakeholders. Such centres should focus not only on the development and delivery of MOOCs but also on their usage. Without massive usage, MOOCs are a contradiction in terms. National support centres for MOOCs and open/online education, eventually linked to existing agencies, should co-ordinate with governmental activities.

Glossary

Accessibility

The extent to which a(n) (online) course is designed to allow disabled students to take part in all the activities available to their non-disabled peers and achieve all the learning outcomes. This includes technical aspects such as conforming to accessibility standards, the provision of alternative formats, and processes for making reasonable adjustments to accommodate individual needs. Aim: provide equal access and equal opportunity to people with disabilities.

Introductions on making information and webpages accessible can be found here:

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/Guidelines%20for%20Accessible%20Information_EN.pdf and http://www.ict4ial.eu/guidelines-accessible-information

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

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

Badges (digital)

Digital badges are an assessment and credentialing mechanism that is housed and managed online. 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 (MacArthur Foundation, 2016).

Certification

A valued credential awarded in several fields that proves competency upon satisfactory demonstration of particular knowledge and skills.

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; when a course is designed for massive audiences, the interaction with academic staff is limited;

(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 (non-formal) recognition options; a formal certificate is optional and most likely has to be paid for.

MOOC (massive open online course)

MOOCs are online courses designed for large numbers of participants, that can be accessed by anyone anywhere as long as they have an Internet connection, are open to everyone without entry qualifications and offer a full/complete course experience online for free (Mulder & Jansen, 2015).

However, no unambiguous, straightforward definition of a MOOC is broadly accepted. The following definitions from different sources illustrate this:

- An online course that normally 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 (generally 1,000 or more); scalability is its distinguishing aspect (Porter & Beale, 2015).
- An online course aimed at unlimited participation and open access via the Web. In addition to traditional course materials such as filmed lectures, readings, and problem sets, many MOOCs provide interactive user forums to support community interactions between students, professors and teaching assistants ("Massive open online course," 2016).

MOOC platform

The hardware and software needed to publish and run a MOOC. A MOOC platform can be run by the institution itself or outsourced to MOOC platforms such as edX, Coursera, Udacity, Iversity or Futurelearn.

MOOC provider

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

MOOC typology (cMOOC/xMOOC)

Along with their expansion, confusion has arisen around what a typical MOOC would look like and what could be expected as its main added value. Siemens (2012) used the terms cMOOC and xMOOC to contrast two forms of pedagogy. The connectivist-inspired approach, cMOOC, highlights the disruptive and networked nature of the learning experience (Bates, 2015). The second approach, identified as the xMOOC, focuses on the massive scale of outreach and the potential for popularising star professors and top institutions.

Several attempts were made to expand the typology of MOOCs; consequently, many description frameworks for MOOCs have been proposed (Rosselle, Caron, & Heutte, 2014). However, existing taxonomies do not clarify the different characteristics a MOOC may have, depending on its structural, economic, design and technology factors, its visual online communication interface, its content and resources, and its assignments and assessments methods. Moreover, they do not include the main drivers behind HE and the role online and open education can play in developing countries.

In some cases, MOOCs with different pedagogical foundations have been assigned different acronyms. The following offer some examples:

BOOCs (big open online courses): free online courses open to anyone and potentially having 500 participants (http://www.indiana.edu/~booc/what-is-a-booc/)

DOCCs (distributed open collaborative courses): MOOCs based on the principles of recognition and engagement of expertise DISTRIBUTED throughout a network; affirmation that there are many ways and methods of LEARNING; embodiment of COLLABORATIVE peer-to-peer communication modes and learning activities; respect for DIVERSITY, SPECIFICITY and DIFFERENCES among people and in bandwidth across networks; encouragement of the collaborative creation of an HISTORICAL archive (http://femtechnet.org/docc/)

MOORs (massive open online research): an online research and development, open access platform or HE study programme aiming at unlimited participation via the Internet (https://en.wikipedia.org/wiki/Massive_online_open_research)

SPOCs (small private online courses): a version of a MOOC used locally with on-campus students; SPOCs have limited enrolment and are often used as part of a course for credit (https://en.wikipedia.org/wiki/Small_private_online_course)

MOOC-washing

The act of labelling commercial and private products as MOOCs in order to boost sales, despite failing to comply with the criteria and definitions of MOOCs and with their initial goals (Bell, 2012).

Online courses

In the context of MOOCs, online courses are offered 100 per cent online. In a broader context, however, the following definitions exist:

- "A course where most or all of the content is delivered online (>80 per cent of content is delivered online). Typically, there are no face-to-face meetings" (Allen & Seaman, 2015, p. 7).
- "All course activity is done online; there are no required face-to-face sessions within the course and no requirements for on-campus activity" (Coswatte, 2014).

The deciding factor in relation to MOOC offering should be related not only to the amount of course content offered online but to all other course elements as well — i.e., study guide/syllabus, educational content, facilitation of (academic) interaction, activities/tasks and tests, including feedback, assessment and exam. Hence, if even one in-person, on-campus activity is scheduled and required, then the course is blended. Students in a MOOC never need to be on campus.

Online education/learning

An umbrella term used to describe any education or training that occurs via the Internet instead of in a physical classroom. In online education, the 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 (EMPOWER, n.d.).

OpenCourseWare (OCW)

Course materials that are "open and freely available worldwide for non-commercial purposes, such as research and education, providing an extraordinary resource, free of charge, which others can adapt to their own needs" (Rouse, 2011).

Open education

What "open" means in open education has been the subject of some debate (see Open Education Handbook, 2014) and is increasingly becoming associated with "free" only. Note, for example, that the Open Education Consortium focuses its description on free and open sharing in education (Open Education Consortium, n.d.). In his book The Battle for Open, Martin Weller (2014) has given an overview of the open movement, concluding that "adopting a single definition is counter-productive" and that motivations for the open approach are of greatest importance. 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).

The following statement relates to the most commonly cited 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 Foundation & Open Society Foundation, 2008). Note that the above aim of open education is directed not just at access barriers but at all barriers along learning paths.

Open educational practices (OEP)

The leading practices in open education that stimulate success participation in education by focusing on the removal of all kinds of barriers in education, and on the (re)use and production of OER and services, within the framework of educational policies.

Open educational resources (OER)

Although some parts of the definition of OER are arguable (Creative Commons, 2016), we can generally describe them as online learning materials that can be retained, reused, revised, remixed and redistributed for free.

OER are teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open licence that permits no-cost access, use, adaptation and redistribution by others, with no or limited restrictions.

Current discussions may also include other descriptions, such as "openly licensed educational resources," "Creative Commons licensed educational resources" or "anything that can be used for teaching and learning and that has an open licence."

Open licensing

Granting of copyright permissions beyond those offered by standard copyright law. The most openly licensed materials may be freely accessed, reused, modified and shared by anyone.

Open licensing policy with respect to MOOCs can refer to:

(a) the educational software used for the MOOCs platforms (open source);

(b) the (scientific) output of MOOC participants as part of their (productive) tasks in a MOOC (open access);

(c) the educational resources (i.e., OER); and/or

(d) the data produced in MOOCs (open data).

Content/courses/software are less open to the extent that their licences place restrictions (e.g., forbidding derivatives or prohibiting commercial use) or requirements (e.g., mandating that derivatives adopt a certain licence or demanding attribution to the original author) on the user wishing to engage in one or more of the retain-reuse-revise-remix-redistribute activities (Wiley, 2007, 2014).

As such, open licensing is a continuous construct. Over the past years, Creative Commons[8] has developed a system of open licences that are suitable for different circumstances and are commonly applied in the OER world. The most liberal (open) is the CC BY licence, which only requires attribution to the original creator(s). Put simply, the fewer the copyright restrictions placed on the user of a piece of content, the more open the content.

Open university

An open university is a university that is open to people without formal academic qualifications and where teaching is conducted at a distance, using specific didactics and media.

Openwashing

This term is applied to services and products presented as being open but failing to comply with the openness criteria established by the open movement.

Quality assurance

A mechanism to assure users that the quality of what they are about to use reaches suitably high standards. In HE, this implies the inclusion of quality of teaching, resources, assessments, etc., as well as the quality of the institution.

Recognition

A formal acknowledgement by a competent authority of the value of a foreign educational qualification, with a view to enhancing the holder's access to educational and/or employment activities.

Social inclusion

The process of improving the terms for individuals and groups to take part in society. Social inclusion aims to empower poor and marginalised people so they can take advantage of burgeoning global opportunities. It ensures that people have a voice in decisions affecting their lives, and that they enjoy equal access to markets, services, and political, social and physical spaces (see World Bank, 2013).

8 See http://creativecommons.org.

Social mobility

The movement of individuals, families and/or households over time from one class to another. Social mobility can be up or down and can occur between generations (intergenerational) or within a generation (intragenerational) (see "Social Mobility," 2016).

Summative assessment

Assessment (often taking place at the end of a course or programme) leading to the assigning of a grade or a mark to the student. The results of summative assessment determine whether a student progresses to the next stage of the programme or, on completion, gains an award.

Widening participation

Widening participation in HE is a major component of government education policy — to increase not only the numbers of young people entering HE but also the proportion from under-represented groups (e.g., those from lower-income families, people with disabilities and some ethnic minorities)
(https://en.wikipedia.org/wiki/Widening_participation)

Workload

A quantitative measure (e.g., measured in hours) of the learning activity that is, on average, necessary for the completion of a course.

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Since 2012, known as "the Year of the MOOC", Massive Open Online Courses (MOOCs) have expanded worldwide, shaking up the higher education landscape, potentially disrupting the model of brick-and-mortar universities. While higher education institutions have long been engaged with the delivery of online content (Open Educational Resources; Virtual Learning Environments), the rapid advent of MOOCs is regarded by some experts as an education revolution. However most of current MOOCs are delivered by top universities in the North, being considered by many as a one-way transfer of knowledge from the developed countries to the developing world.

The present UNESCO-COL Guide on MOOCs is designed to raise general awareness amongst policymakers in developing countries as to how MOOCs might address their concerns and priorities, particularly in terms of access to affordable quality higher education and preparation of secondary school leavers for academic as well as vocational education and training. With very few exceptions, many of the reports on MOOCs already published do not refer to the interest and experience of developing countries, although we are witnessing important initiatives in more and more countries around the world.

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