



Time for MOOCs

MOOC Commission sub-report

13 December 2013

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1 Introduction

1.1 The Commission's mandate

The Commission was appointed by Royal Decree on 21 June 2013 and given the following mandate:

Recently, there has been a rapid growth in Massive Open Online Courses (MOOCs) and similar educational services. MOOCs are free courses supplied through the Internet via streaming video from higher education institutions and from companies that collaborate with such institutions. Large, renowned institutions such as Harvard, Stanford and MIT have fronted the development, and an increasing number of institutions across the globe are now offering MOOCs. In principle, anyone may now attend courses taught by the world's leading academics. The only requirement is Internet access. Millions of people across the world are taking advantage of this opportunity.

The Norwegian Government has appointed a Commission to inquire into the possibilities and challenges that accompany the development of MOOCs and similar offers. The Commission shall map out the development, compare the information gathered, as well as provide Norwegian authorities and educational institutions with recommendations on how to relate to this development while also taking advantage of the opportunities provided by modern technology. Due to rapid developments in this field, the Commission is preparing for a two-step process:

1. The Commission will present its first report by the end of 2013. The report shall contain an overview of the development, along with some principal recommendations based on the following issues:
 - What is the scope and development of MOOCs and who are the actors – both nationally and internationally?
 - What are the driving forces behind their development and which players and offers are likely to succeed?
 - Which professional support networks are being established in connection with these educational services?
 - What impact will this development have on Norway from a broad societal perspective?
2. In the summer of 2014, the Commission will present a more detailed report, including proposals on how Norway should respond to these developments.

Both in step 1 and step 2, the Commission is required to specifically consider which possibilities and challenges the development of MOOCs and similar offers may create in the following areas:

- Higher education, for example
 - Educational grants and loans
 - Financing of study programmes
 - Accreditation and quality assurance
 - Quality in higher education and research-based education
 - Strategic use of MOOCs
 - Cooperation, division of labour and concentration (SAK)
 - Image-building
 - International cooperation
 - Universal design

- Lifelong learning/continuing and further education, for example
 - Skills upgrades in working life, including small and medium-sized businesses (SMBs)
 - Regional collaboration between commerce and industry, working life and educational institutions, including development of tailored programmes for continuing and further education in cooperation with participants in working life.

The Commission shall consider and quantify administrative and economic consequences of the actions proposed. The Commission shall consider at least one proposal that can be accomplished without expanding the use of resources within the higher education sector.

The Commission held its first meeting on 22 August 2013 at the Ministry of Education and Research (KD). The meeting was opened by Rolf L. Larsen, Deputy Director General and Deputy Head of KD's Department of Higher Education, and Eivind Heder, Director-General of the Department of Policy Analysis, Lifelong Learning and International Affairs, with a presentation on the background of the mandate and Commission's appointment. Reference was e.g. made to the fact that the MOOC Commission's mandate must be viewed in the context of other commission work and ongoing processes within higher education. It was also mentioned that, if the Commission has proposals with budget consequences and wants them to be assessed vis-à-vis the 2015 Budget, such proposals should be discussed in the first sub-report to be submitted by the end of 2013. On this basis, the MOOC Commission has chosen to spend time discussing the need for measures with budget consequences and measures that have an impact on financing of higher education.

The Commission is asked to provide an assessment of what challenges and opportunities are expected to accompany the emergence of MOOCs and similar provisions as regards higher education. In the context of this report, when the Committee mentions higher education in Norway, this also includes higher education in, about and using the Sami language.

1.2 The Commission's composition and secretariat

The Commission was appointed with the following composition:

- Berit Kjeldstad, Professor and Pro-Rector for Education at NTNU (chair).
- Harald Alvestrand, software engineer, Google
- Mathis Bongo, Assistant Professor of Education at Sami University College
- June Breivik, Chief Developer of BI Learninglab and e-learning
- Endre Olsvik Elvestad, student at NTNU
- Ola Erstad, Professor of Education at the University of Oslo
- Eva Gjerdrum, Director of Norway Opening Universities (NOU)
- Trond Ingebretsen, Director of the Norwegian Centre for ICT in Education
- Arne Krokan, Professor of Sociology at NTNU
- Bergljot Landstad, Head of the Regional and Commercial Department in Møre og Romsdal County Authority
- Ingrid Melve, CTO of UNINETT (develops and operates the Norwegian national research and education network - transl. note)

The Commission's secretariat has consisted of:

- Deputy Director General Berit Johnsen (chair)
- Senior Adviser Bjørn Tore Bertheussen
- Senior Adviser Simen Rommetveit Halvorsen
- Senior Adviser Frode Hauge

- Head of Section André Løvik

1.3 The Commission's work

The Commission held four committee meetings in Oslo during the autumn of 2013: 22 August, 18 September, 17 October and 20 November.

At the commission meeting on 18 September, Paul Chaffey, former CEO of NHO's (the Confederation of Norwegian Enterprise's) Business Association for Norwegian knowledge and technology-based enterprises (Abelia), was invited to speak about upgrading skills in business and the labour market. Deputy Director General Anne Line Wold and Senior Adviser Øystein Holmedal-Hagen from KD were invited to inform the Commission about the financing system in higher education and student fee rules, respectively.

At the commission meeting on 17 October, Senior Adviser Toril Måseide and Senior Adviser Tone Flood Strøm from KD were invited to speak about the educational support system and system for quality assurance, accreditation and recognition in higher education, respectively.

The Commission has established its own Facebook page, as well as a website for the MOOC Commission on regjeringen.no. The Commission has solicited feedback on its Facebook page.

In order to acquire the best possible knowledge basis both nationally and internationally, the Commission has requisitioned a number of external contributions. Most commission members have also contributed notes on various issues.

The following external persons and organisations have provided written contributions:

- Director Frode Arntsen, BIBSYS
- Senior Adviser Helge Halvorsen, the Confederation of Norwegian Enterprise (NHO)
- Senior Adviser Bent Kure, University of Oslo
- Director of study and research Jan Atle Toska, University of Nordland
- Secretary General Gard Titlestad, International Council for Open and Distance Education (ICDE)

The Ministry of Education and Research and the Norwegian Centre for ICT in Education have provided a secretariat and have also contributed materials and input beyond this.

1.4 The Commission's definition of MOOC

In its work, the Commission has chosen to emphasise the overall common features of MOOC and similar provisions. "Similar provisions" means other forms of web-based provisions or provisions that combine web-based and campus education. In this report, the MOOC term is therefore used as a catch-all for courses with the following characteristics:

- Courses that are online
- Courses that are massive, i.e. scalable as regards the number of participants
- Courses that are open, i.e. anyone can sign up for them

The Commission operates with the following clarifications of the three characteristics. The Commission takes a point of departure in courses that are online, but its work also includes courses with sliding transitions into what is called *blended learning*, which means studies that combine web-based and campus education. The Commission has also chosen to include courses with different degrees of openness, be it as regards course fees, qualification requirements and the use of learning resources. Finally, the Commission operates with a

broad definition of courses. This includes not only short further education programmes, but also multi-year, credit-earning degrees with the other characteristics as described above.

The Commission discusses its definition of the MOOC concept in Chapter 5.1.

2 Report structure and summary of the Commission's recommendations

2.1 Report structure

The Commission shall present a report by the end of 2013 and a main report by the summer of 2014. This first report is divided into the following chapters:

Ch. 1: Introduction

Ch. 2: Report structure and summary of the Commission's recommendations

PART I: The development of MOOCs

Ch. 3: MOOCs – a resource for developing skills

Ch. 4: Technological development trends

Ch. 5: MOOCs from 2008 to 2013: idealism and *big business*

PART II: The Commission's assessments

Ch. 6: What can the emergence of MOOCs mean for Norwegian higher education?

Ch. 7: Economic and administrative consequences

PART III: Appendices

In Part 1 (Chapters 3, 4 and 5), the Commission provides a background and knowledge description of the MOOC development. In Chapter 3, the development is placed in a broader societal perspective, with emphasis on how MOOCs can contribute to a knowledge-based society and thereby to future growth and prosperity. The Commission has a positive impression of MOOCs and similar provisions, i.e. other forms of web-based provisions or provisions that combine web-based and campus education. Such provisions may be supplements to and part of higher education, including continuing and further education.

The Commission believes that MOOCs have two crucial roles to play in the Norwegian knowledge society. Firstly, such provisions have a potential to strengthen access to higher education. Secondly, such provisions have a potential to strengthen the quality of higher education. Both of these aspects also have a broader range of societal implications. The Commission believes that, if this potential is utilised, it may also have a great significance for lifelong learning, continuing and further education, as well as the skills needed by business and the labour market. In Chapter 4, the Commission describes technological development in general and in higher education.

Web-based provisions have developed gradually in line with technological development, both nationally and internationally. This development is described in the report's Appendices 1 and 2. To a certain extent, MOOCs can be viewed as an extension of this development, but also have certain features that clearly distinguish them from other forms of web-based higher education. Among other things, this concerns other types of technology and educational perspectives on learning. MOOCs thus, to a certain degree, also represent a departure from previous forms of web-based higher education. The emergence and special characteristics of MOOCs are presented in Chapter 5.

In Part 2 (Chapter 6), the Commission discusses opportunities and challenges linked to MOOCs. On the basis of their international development, the Commission assesses issues in a Norwegian context and examines which overall and principal measures are appropriate in order to utilise the potential inherent in the use of MOOCs. The Commission believes that the Norwegian authorities, institutions and business and the labour market should actively seize this potential.

In this first report, the Commission has prioritised working on some of the challenges and opportunities it believes that MOOCs and similar provisions can pose, both for Norwegian higher education and for Norway in a broader societal perspective. Topics discussed in the report include educational science and quality development, technological infrastructure, skills needed by business and the labour market, MOOCs as part of Norwegian degree programmes, student fee rules in higher education, educational support, as well as financing of higher education. In Chapter 7, the Commission summarises the recommendations that have economic and administrative consequences.

2.2 Relationship between the sub-report and the Commission's final report

The level of detail in the assessments and recommendations in Chapter 6 vary between the different sub-chapters. In most areas, the Commission's assessments and recommendations are therefore of a more general nature in this report, with focus on issues the Commission will continue working on toward its final report.

In the Commission's final report in the summer of 2014, the Commission will also discuss other topics that are not covered in this report. Among other things, this will include those who participate in MOOCs, learning activities, assessment/grading and exams, legal aspects such as copyright, open resources and data storage, universal design, strategic international cooperation, as well as cooperation, division of labour and concentration within the sector. The Commission's prioritisation of topics in this first report must also be viewed in light of the Commission's interpretation of its mandate, cf. Chapter 1.1.

2.3 Summary of the Commission's recommendations

In Chapter 6, the Commission provides a number of assessments and recommendations. Chapter 7 provides a comprehensive overview of the recommendations with economic and administrative consequences.

The Commission has a positive impression of MOOCs and similar provisions, i.e. other forms of web-based provisions or provisions that combine web-based and campus education. The Commission believes that Norway should seize the potential inherent in MOOCs as a supplement to or part of Norwegian higher education. In order for Norway to utilise this potential, the authorities and higher education sector must take action, both strategically and professionally.

The following is an overview of the Commission's recommendations:

Ch. 6.2 Innovative education science and quality development

- The Commission recommends a systematic focus on research-based knowledge development in ICT and learning.
- The Commission recommends establishing an environment for research-based knowledge development and knowledge transfer linked to learning analytics starting in 2015, with an annual appropriation of NOK 15 million. The structure and form must be assessed in relation to the current players and range of instruments.
- The Commission believes that the higher education sector is using a limited amount of incentives at the individual level as regards teaching development. This does not stimulate and motivate the utilisation of new technology and new teaching methods. The Commission therefore recommends a review of the range of general instruments and incentive schemes for the education area, at the individual, institution and national level. The instruments must be coherent and pull in the same direction.
- The Commission recommends appropriating funds toward the development of digital skills among employees in the higher education sector. The Commission proposes an annual appropriation of NOK 10 million.

- The MOOC Commission recommends having the Ministry-appointed commission tasked with inquiring into skills outside the formal education system also assess skills developed through MOOCs without exams and credits.

Ch. 6.3 Infrastructure for MOOCs and other digital learning

- The Commission believes there is a need for continuing and increasing the national appropriations for technological infrastructure. The Commission proposes increasing the appropriations toward development of infrastructure for web-based education in general by NOK 10 million annually, as well as an annual NOK 10 million toward developing new infrastructure for MOOCs in particular.
- The Commission recommends more in-depth study of whether it is appropriate to have a single, national MOOC portal or whether alternative solutions are better.

Ch. 6.4 Skills needed by business and the labour market

- The Commission recommends that business and the labour market use MOOCs and similar provisions for employee skills development.
- NOK 10 million has been appropriated for continuing education for teachers using MOOCs and similar provisions. The Commission recommends allocating an additional NOK 10 million to develop and acquire experience in the use of MOOCs and similar provisions in continuing education within other relevant education areas as well.

Ch. 6.5 MOOCs as part of the Norwegian degree system: accreditation and recognition of MOOCs

- The Commission believes that MOOCs do not warrant changes to the Norwegian regulations for accreditation and recognition of subjects and courses going into a degree system. MOOCs with exams and credits from both Norwegian and foreign institutions can be natural parts of this system as it exists today.
- The Commission recommends that the institutions exploit the latitude available in administering the regulations for recognising the subjects and courses going into a degree system, by facilitating better and more efficient practice across Norwegian institutions.
- The Commission recommends a study of whether the current practice is appropriate and what can be done to strengthen the institutions' exploitation of the latitude in the current regulations for recognising subjects and courses going into a degree system.
- The Commission recommends trials with admission to MOOCs at Norwegian institutions for applicants that do not satisfy the traditional requirements for admission to higher education.

Ch. 6.6 Student fees and the free principle in higher education

- The Commission believes that MOOCs in Norway should, as a point of departure, be free.
- The Commission recommends that the Ministry review the regulations for student fees in order to clarify the institutions' opportunities to charge student fees for parts of a participant group.

Ch. 6.7 Educational support

- The Commission proposes to consider whether to provide educational support to students in MOOCs and similar provisions with flexible course loads and durations. Similar provisions means other forms of web-based provisions or provisions that combine web-based and campus education.
- The Commission also believes that MOOCs and similar provisions outside Norway and the EU/EEA should be considered as a basis for educational support.
- The Commission believes that assessments of changes to the educational support system must also include consequences linked to foreign students.

Ch. 6.8 Financing higher education

- The Commission recommends that the financing system facilitate incentives or systems that support collaboration between institutions as regards the development and range of MOOCs and similar provisions, for example through flexible ways to share the gains of credit production.
- The Commission recommends introducing an incentive for relevance of education in the financing system. Collaboration between education institutions and private businesses on MOOCs and similar provisions may be an indicator of such relevance.
- The Commission recommends allocating an annual appropriation within the strategic funds in the financing system, to support the development of educational content in and development of technological infrastructure for MOOCs and similar provisions.

PART I
THE DEVELOPMENT OF MOOCs

3 MOOCs – a skills development resource

Knowledge society: the importance of education for growth and prosperity

People are Norway's most important resource. Human capital makes up about 80 per cent of national wealth. An investment in human knowledge is an investment in the most important basis for future growth. Education is important under such circumstances – not only for the individual, but also for the further development of Norwegian society and prosperity.

In an international context, Norway is a small, open economy. Norwegian value creation and prosperity are founded on extensive economic, cultural and political interaction with the surrounding world. The labour market is changing at an ever quicker pace, which demands highly developed knowledge and adaptability. The white paper Long-Term Perspectives for the Norwegian Economy from 2013 shows that more efficient use of labour and capital is the most important source of prosperity growth over time.¹ Productivity growth is linked to increased labour quality – which means labour characterised by e.g. updated skills, creativity and collaborative capacity. Modern growth theory greatly emphasises human capital as a source of economic growth. A high level of human capital promotes the ability to carry out new tasks and acquiring new knowledge, for innovation and adaptation. The OECD points out that greater utilisation of human resources may result in more and better jobs, greater economic activity and higher participation in the labour market.

Education is crucial in order to secure a knowledge-based business and labour market. One important social mandate for universities and university colleges is to educate candidates that society needs and focus its research in society's best interest over the short and long term. The education and research sector must satisfy the needs of working and social life for knowledge and skills. Working life is becoming increasingly knowledge-intensive and the extensive interaction with other countries requires different types of knowledge and skills than before. An education sector with high international quality is therefore one of the most important preconditions for further growth and taking on global and national challenges such as the environment, climate, health and prosperity.

Overall, a well-developed higher education sector, free higher education and good educational support systems, mean that the Norwegian population have easy access to higher education. At the same time, it is important to have opportunities to learn throughout life. An important part of the societal role of universities and university colleges is therefore to facilitate lifelong learning, regardless of age, place of residence and life situation. Flexible education is a key term in this context. Flexible education deliveries means education that can be carried out regardless of time and place, education deliveries that require less presence on campus. In such provisions, technology is an educational tool and a component in the organisation and implementation of education. In 2012, approx. 16 000 students utilised various forms of flexible education, and increase of 25 per cent from 2006. In 2012, this amounted to about seven per cent of students in Norway.

Driving forces behind the MOOC development

It is claimed that the development of web-based higher education, most clearly illustrated by the MOOC development, has the potential to fundamentally transform higher education. In 1997, Clayton M. Christensen, professor of economics at Harvard, published a book in which he asked why major, leading companies in an industry can often fail in their encounter with new, pioneering innovations – so-called disruptive innovations.² He

¹ Ministry of Finance white paper (2013) Meld. St. 12 (2012-2013) *Long-Term Perspectives for the Norwegian Economy 2013*.

² Christen, Clayton M. (1997) *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*. Harvard Business Press.

investigated a number of industries and found the same pattern: the largest established companies in the industry will fail as they encounter disruptive innovation. Christensen, and others, believe that web-based education may become such a disruptive innovation. In recent years, new technology has enabled extensive developments in web-based education. The emergence of MOOCs is the most obvious example of this. It is an innovation that introduces something entirely new in higher education: cheaper and more accessible services, both in time and space.

One driving force behind the development appears to be a clear democratisation and development aspect. Education is crucial for economic and sustainable development, and there is a rising global demand for access to higher education. In India alone, there will be a need to enrol an additional 40 million students by 2025.³ Whether or not MOOCs are the solution to this rising demand, is an ongoing and complex debate.⁴ What is certain, however, is that MOOCs appear to have a promising *potential* for making higher education more accessible to new groups. One example of this development is Kepler – a university programme designed for developing countries. In 2013, Kepler opened its first campus in Rwanda. This pilot project combines MOOCs supplied by international platforms such as edX and Coursera with local campus education. The objective is to develop a global network of universities that can provide high-quality education and career opportunities at a price everyone can afford – about USD 1000 per year.⁵

Another important driving force behind the emergence of MOOCs is the students' own desires. In an article in the NY Times in November 2013, Clayton M. Christensen and Michael B. Horn argue that students will embrace these new services.⁶ Resource efficiency is another important driver: economic crises have put considerable strain on cost efficiency in welfare services, including higher education. At the same time, MOOCs are a good opportunity for institutions to broadly communicate their study programmes. In the same vein, positioning in a competitive market is also an important driver behind the development.

When these key driving forces are supported by new, ground-breaking technological opportunities, the transformative potential is significant. According to Christensen and Horn, the consequence will be that many of the current education institutions, about 25 per cent, will not be able to adapt and will thus cease to exist or be forced to merge with others.⁷

MOOCs in a Norwegian context – challenges and opportunities

It is difficult to give a clear answer as to whether higher education is facing disruptive innovation of the kind referenced by Christensen. It is difficult to know whether an innovation is disruptive until after it potentially becomes one. To what extent this will reach

³ Everitt, Richard (2013) *The new education laboratory: 10 things you need to know about MOOC*. Available at: <http://usa.britishcouncil.org/blog-mooc> (Accessed: 10 December 2013).

⁴ UK Department for Business, Innovation and Skills (2013) *The Maturing of the MOOC*. BIS Research Paper number 130. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/240193/13-1173-maturing-of-the-mooc.pdf (Accessed: 10 December 2013).

⁵ Kepler (2013). Available at: www.kepler.org (Accessed: 10 December 2013).

⁶ Christensen, Clayton M. & Horn, Michael B., The New York Times (2013) *Innovative Imperative: Change Everything. Online Education as an Agent of Transformation*. Available at: <http://www.nytimes.com/2013/11/03/education/edlife/online-education-as-an-agent-of-transformation.html?> (Accessed: 10 December 2013).

⁷ Christensen, Clayton M. & Horn, Michael B., The New York Times (2013) *Innovative Imperative: Change Everything. Online Education as an Agent of Transformation*. Available at: <http://www.nytimes.com/2013/11/03/education/edlife/online-education-as-an-agent-of-transformation.html?> (Accessed: 10 December 2013).

Norway, is also difficult to divine. For example, the driving forces of cost efficiency in services and a desire for cheaper higher education are not as strong in Norway, where higher education is free for students and public budgets are less strained. Equally relevant to Norway is the development in Europe as regards the focus on MOOCs. In Europe, large countries such as France and Germany are establishing national MOOC portals. The EU Commission supports the Openuped portal, a MOOC portal for higher education institutions in the EU. This shows that the focus on MOOCs in Europe is driven by the need to contribute to improved access to higher education services, a higher level of education for EU citizens and utilisation of technological developments. These important objectives are shared by the Norwegian education authorities as well.

Regardless of how far this development will go in Norway, the Commission believes that flexible education in general and MOOCs in particular have two crucial roles to play in knowledge development. MOOCs as a phenomenon contribute to this development, the opportunities and the potential presented by the development. Firstly, such provisions have the potential to improve access to higher education. Web-based higher education in Norway has primarily been a more flexible way to offer the same content as in traditional campus studies. MOOCs are a novelty in that these provisions are aimed at a broader group of learners and not only the traditional student. MOOCs are of interest to the campus student, to those who are curious and interested in learning something new, to those with a desire for continuing and further education – to mention a few groups. MOOCs could become very important for those groups of learners who do not have the opportunity or desire to take traditional campus studies. This e.g. applies to those who, for practical reasons, do not have the opportunity to travel to an education institution due to their place of residence and life situation and those who are already working and need basic education or new and more specialised skills.

Secondly, MOOCs have the potential to strengthen the quality of higher education. This type of provision makes time and place less relevant and thus creates a broader supply side, and Norwegian learners and companies will have access to a large number of deliveries from international suppliers. The foremost international universities will thus become real providers of skills in Norway as well. This has the potential to become an important and good-quality supplement to the education offered by Norwegian institutions. Strong foreign players, both familiar, traditional institutions and new commercial players, will put pressure on the Norwegian institutions through increased competition. At the same time, the Norwegian institutions will, by using the opportunities inherent in new technology, be able to develop their study programmes and thereby seize the emerging opportunities. This will allow increased competition to bring about a quality development in Norwegian higher education. In the Commission's opinion, this will require proactive institutions that can grasp these opportunities. This applies particularly to collaboration between universities and university colleges and business and working life, as well as the development of relevance in higher education. New technology opens up new forms of collaboration with business and working life, and better collaboration may lead to increased relevance in the institutions' study programmes for the same business and labour market. At the same time, the use of new technology, new services and an entirely new market may also be accompanied by certain challenges. Norwegian education institutions are very diverse, e.g. as regards size and academic focus areas. Their ability to compete in a global knowledge market may vary significantly and the need for collaboration will increase.

On this basis, the Commission believes that MOOCs have a significant potential for further development of the Norwegian knowledge society. The Commission believes that Norwegian authorities and higher education institutions must seize the opportunities resulting from the MOOC development. This requires a capacity for strategic management from both

authorities and institutions, and it requires a will to adapt among institutions. If these opportunities are seized, the Commission believes that flexible education in general and MOOCs in particular will help strengthen the quality of education offered and thus better enable Norway to meet the skills-related needs in the labour market both now and in the future.

The Commission will delve further into the driving forces, challenges and opportunities presented by MOOCs in Chapter 6 of the report. However, the Commission first wants to provide an overview of technology trends (Chapter 4) and a description of MOOCs as a special phenomenon (Chapter 5).

4 Technology trends

The Internet's transition from research network to mass medium can be dated to the mid-1990s, when free web browsers (such as Mosaic from 1993 and Netscape from 1994) provided support for links and images in text. The *World Wide Web* enabled users to read websites and click on to websites on other servers without different IT equipment creating barriers. E-mail, and later chat, made the exchange of messages from person to person quick and easy.

The creator of the *World Wide Web*, Tim Berners-Lee, envisioned that scientists would be able to exchange information regardless of which IT equipment and which PCs are were used.⁸ He wanted the world wide web to be a medium where users could both read and write on websites, thus handling word processing directly on the websites. Nevertheless, in 1994, the first browsers dropped support for word processing, hence the name *browser*. For a period of 5-10 years, it was considerably more difficult to publish than read online. This led to the Internet being dominated by one-way communication modelled after the traditional mass media, where a message is sent from one to many. This phase and form of communication has later been defined by the retronym web 1.0.

In the next phase, improvements in user friendliness and technology made it easier to publish content online, thus finally fulfilling the original intention of the web as a medium for sharing, collaboration and two-way communication. The period between the dotcom boom in 2001 and the financial crisis in 2008 saw the breakthrough of websites and technology for sharing and co-writing: wikis and Wikipedia from 2001, photo sharing (Flickr from 2005), blogging became a mass phenomenon and Facebook reached Norway in earnest in 2007. This lowered the threshold for sharing content online. In 2009-2010, websites that facilitated discussion and personal communication were given the moniker social media. Examples of such online resources include Facebook, Twitter, Google+, blogs, wikis, video sharing services such as YouTube and Vimeo, and *mashups*.⁹ Websites that utilised technology beyond the capabilities of static websites have been called web 2.0.

MOOCs use web 2.0 elements to a great extent, which enables a partial shift of the social dimension from campus to the web. A number of important technology trends have bolstered this. For example, the online resources needed have gone from being very costly to easily available and reasonable. The development in online video distribution in particular has caused massive development of networks, including mobile networks, in a tempo where each individual now has the capacity to run media-heavy services such MOOCs. Ten years ago, distance learning services largely had to adapt to the network infrastructure. Today, sufficient network resources are ubiquitous.

At the same time, the technology resources needed to produce good-quality educational materials have similarly declined. Ten years ago, a mid-range video camera cost thousands of kroner. Today, you can hardly buy a PC or mobile without a video camera, and HD quality has become something you can find at the supermarket. However, production of high-quality video materials has not dropped in price at the same tempo; the knowledge surrounding lighting, audio processing and educationally relevant use is hard to find and relatively expensive to acquire.

⁸ Berners-Lee, Tim (2000) *Weaving the Web: The Original Design and Ultimate Destiny of the World Wide Web*.

⁹ Web application that integrates data from multiple sources and presents them on a single page. Wikipedia (2013) *Mashup (web application hybrid)*. Available at: [http://en.wikipedia.org/wiki/Mashup_\(web_application_hybrid\)](http://en.wikipedia.org/wiki/Mashup_(web_application_hybrid)) (Accessed: 10 December.2013).

4.1 OpenCourseWare and Open Educational Resources

OpenCourseWare (OCW) and *Open Educational Resources* (OER) represent two important and closely related trends that may be related to the emergence of MOOCs. The similarities include both the use of technology at higher education institutions, as well as improving the access to learning and education for as many as possible.

The OCW movement started around the turn of the century, when the University of Tübingen, as the first higher education institution to publish recordings from classes, open and free of charge on the Internet. However, the movement did not catch on until a few years later, when the Massachusetts Institute of Technology (MIT) established MIT OpenCourseWare (MIT OCW). The objective was as follows:

*“... to make MIT course materials that are used in the teaching of almost all undergraduate and graduate subjects available on the web, free of charge, to any user anywhere in the world. MIT OCW will radically alter technology-enhanced education at MIT, and will serve as a model for university dissemination of knowledge in the Internet age”.*¹⁰

The original intent of the movement was thus to use the Internet to disseminate knowledge globally, which was considered to be the original idea of universities, while at the same time giving students associated with the university the opportunity to prepare for classes.¹¹ The OCW materials are normally organised as courses, and often include planning materials and evaluation tools in addition to the academic content. The course materials are under open licence and are made available to everyone via the Internet.¹² The spearhead of MIT's OCW project, Hal Abelson, was also one of the founders of Creative Commons. Creative Commons can be viewed as a contractual version of the principles behind the OCW project, to be used for freely licensed culture in general, not only learning resources.¹³

The range of services providing these types of course materials has broadened since their introduction. As early as in 2007, the UK's Open University has 16 million downloads via iTunes U. Today, it is estimated that there are more than 250 higher learning institutions offering a total of more than 9000 courses.¹⁴

Open Educational Resources (OER) is closely linked to OCW. OER was launched by UNESCO in 2002. OER has a broader impact, and education, learning or research materials that are openly available for use by teachers and students without having to pay royalties or licence fees. OER can be freely reused, adapted and distributed.¹⁵ The rights to OER are regulated through open licensing, most commonly through Creative Commons, which makes this use free of charge.¹⁶

¹⁰ MIT (2013) *MIT Open Courseware – Fact Sheet*. Available at: <http://web.mit.edu/newsoffice/2001/ocw-facts.html> (Accessed: 29 November 2013).

¹¹ Wikipedia (2013) *OpenCourseWare*. Available at: <http://en.wikipedia.org/wiki/OpenCourseWare> (Accessed: 29 November 2013).

¹² OpenCourseware Consortium (2013) *About us*. Available at: <http://www.ocwconsortium.org/aboutus/> (Accessed: 29 November 2013).

¹³ Wikipedia (2013) *Hal Abelson*. Available at: http://en.wikipedia.org/wiki/Hal_Abelson and Creative Commons (2013). <http://creativecommons.no> (Accessed: 29 November 2013).

¹⁴ OpenCourseWare (2013) *OpenCourseWare: changing how we learn since 1999*. Available at: <http://opencourseware weblog.tudelft.nl/2013/07/26/opencourseware-changing-how-we-learn-since-1999/?TUD-USE-COOKIES=yes> (Accessed: 29 November 2013).

¹⁵ OpenCourseWare Consortium (2013). Available at: <http://www.ocwconsortium.org> (Accessed: 29 November 2013).

¹⁶ Creative Commons (2013). Available at: <http://creativecommons.org> (Accessed: 29 November 2013).

Nor is there a requirement for the materials to be available digitally, even though this will be the most common scenario in our part of the world. OER is not the same as Open Access, which is open access to peer-reviewed scientific articles online. Open Access can be part of OER, depending on the rights associated with the individual article, and may play an important role in strengthening research-based education.

UNESCO wants publicly funded educational materials to be freely available as OER:

“The Declaration marks a historic moment in the growing movement for Open Educational Resources and calls on governments worldwide to openly license publicly funded educational materials for public use.”¹⁷

There are a number of initiatives for textbooks as OER (open textbooks) in the US.¹⁸ The first call for the production of OERs was made by the US government in 2011.¹⁹ In a Norwegian context, it is relevant to mention the National Digital Learning Arena (NDLA), a collaboration between county authorities that aims to provide quality-assured, openly available, web-based course materials for all subjects in upper secondary education.²⁰ Most materials administered by NDLA are OERs and are licensed with Creative Commons.

4.2 Related trends

Several technology trends and terms are closely related and sometimes linked to the MOOC phenomenon. These are not necessarily preconditions for the MOOC development, but can be understood as parallel trends. These include e.g. *Bring Your Own Device (BYOD)*, *adaptive learning*, *big data* and *gamification*.

Norwegian students gained access to the Internet in the 1990s, but at first only from PC rooms at higher education institutions. Later, the Internet became available in student housing units. The transition to laptop PCs made it easier to provide Internet access to students. Broadband coverage in Norway currently exceeds 99%.²¹ Tablets lower the user threshold, and the price of PCs has dropped to one-quarter of the price during the 90s. Smartphones use the same infrastructure that was developed for portable equipment, in addition to benefiting from Norway’s extensive cellular network coverage. Today’s Norwegian students are therefore the country’s largest BYOD environment, along with the challenges represented by providing ICT in an environment where you know nothing about the student’s equipment.

The ubiquitous technology also enables the use of technology in an educational context. Within ICT education, adaptive learning means that learning resources and tasks adapt to what has been answered or chosen earlier. For example, if one correctly solves a problem with a high level of difficulty, the next problem will be even harder, while incorrect answers to a multiple choice problem will make the next problem simpler. The level of difficulty of problems or course materials can either be set manually by professionals or calibrated through learning analytics on those who previously solved the problem correctly. Adaptive

¹⁷ UNESCO (2013) *Open Educational Resources Congress passes historical declaration*. Available at: <http://www.unesco.org/new/en/communication-and-information/resources/news-and-in-focus-articles/in-focus-articles/2012/open-educational-resources-congress-passes-historic-declaration/> (Accessed: 29 November 2013).

¹⁸ Creative Commons (2013) *US Senators seek to make college textbooks affordable and open*. Available at: <http://creativecommons.org/weblog/entry/40598> (Accessed: 29 November 2013).

¹⁹ Watch the following speech: http://www.youtube.com/watch?feature=player_embedded&v=6uP580_TytQ (Accessed: 10 December 2013).

²⁰ NDLA (2013). Available at: <http://ndla.no/> (Accessed: 29 November 2013).

²¹ Nexia (2013) *Dekningsundersøkelsen 2012*. (Coverage survey 2012 - transl. note) Available at: http://www.regjeringen.no/upload/FAD/Vedlegg/IKT-politikk/Bredbandsdekning_2012.pdf (Accessed: 29 November 2013).

tests are especially suitable for mapping the level of difficulty of the subject matter provided to the individual learner later on in the course. Such tests were first used in certification exams in IT and e-learning courses in the US.²²

The digital proficiency of Norwegian students varies, but there are clear expectations for increased use of digital services and content.²³ The increased use of digital tools also provides the opportunity to utilise the produced data for learning purposes as well.

Big data has become relevant in many contexts. The phrase is used for datasets that are so large and complex that we cannot use ordinary tools to process them. It has become simple to collect data, be they about Higgs bosons, galaxies, road traffic or students' learning activities. *Big data* normally concerns measurements with a large scope, brief time cycles and varied data. The use of *big data* within research is growing, and infrastructure is being constructed to handle such data for ever-increasing numbers of disciplines.

In an academic context, *big data* is linked to collecting vast amounts of data from the students' digital activities, and in order to transform this into information that can be used to improve the students' learning outcomes. The MOOC platform Coursera has used large amounts of data from the students' learning activities, achievements and involvement to improve learning outcomes. On the basis of data from hundreds of thousands of students, they have seen how positive wordings in e-mail correspondence stimulate greater involvement in participants than pure reminders about the tasks they must complete.²⁴

How to keep the students' attention directed toward what they need to learn, is a familiar challenge. *Gamification* is an answer to this challenge, and involves using video game-inspired elements in contexts that have nothing to do with (video) games. For example, the University of Stavanger has developed Pillespillet (the pill game - transl. note), a game that gives students practical experience with dosage calculation.²⁵ The basic idea behind gamification is to reward participants who finish their tasks. Gamification is intended to motivate users to solve problems by increasing their involvement and providing a sense of accomplishment. The rewards may be scoring points, or dividing problems into levels, so that completion may entail promotion to a new level. One of the most frequently used gamification elements is to display graphics or a percentage of completed problems. This is often used to get more people to fill in questionnaires and order forms online. The participants can also be awarded virtual trophies or receive virtual currency, which means currency that can be used to purchase virtual goods in the game universe. The methods used for this may be adding a gradually increasing level of difficulty, connecting problems with an overarching storyline (narration) and starting problem-solving with an explanation or introduction course (tutorial). In advanced gamification, the participant is given options by letting the user build a character at the start or during the process.²⁶

²² Wikipedia (2013) *Computerized adaptive testing*. Available at:

http://en.wikipedia.org/wiki/Computerized_adaptive_testing (Accessed: 29 November 2013).

²³ Norway Opening Universities (2012) *Digital tilstand i høyere utdanning 2011*. (Digital status of higher education 2011 - transl. note) Tromsø: Norway Opening Universities.

²⁴ Venturebeat (2013) *Coursera improved online education using – you guessed it – data*. Available at: <http://venturebeat.com/2013/11/19/coursera-improves-online-education-using-you-guessed-it-data/> (Accessed: 29 November 2013).

²⁵ Norway Opening Universities (2013) *Sykepleierstudenter spiller med piller*. (Nursing students playing with pills - transl. note) Available at: <http://norgesuniversitetet.no/node/4478> (Accessed: 10 December 2013).

²⁶ Wikipedia (2013) *Spillifisering*. (Gamification - transl. note) Available at: <http://no.wikipedia.org/wiki/Spillifisering> (Accessed: 29 November 2013).

4.3 Technological infrastructure development in the Norwegian higher education sector

Norwegian higher education institutions have also taken part in the technological development. Norwegian universities were early adopters of the Internet, and the first joint testing of technology and solutions took place as early as in 1976. Starting in 1987, there was a more systematic effort through the UNINETT project. The Norwegian Universities and Colleges Admission Service (Samordna opptak) was digitised in 1992, which meant that all public university colleges were connected to the Internet.²⁷ Since 1993, UNINETT has been the national research network and it works on joint solutions. Through NORDUnet (Nordic Infrastructure for Research & Education), the higher education sector has secured good network capacity vis-à-vis the US and Europe, and eventually to the rest of the world.

The Quality Reform brought about closer follow-up of students' study progression. In order to document details about which courses each individual student had taken, there was a demand for better study administration routines. The solution was e.g. the introduction of *Learning Management Systems* (LMS) at universities and university colleges that did not already have such systems. Over the past ten years, digital learning resources have been distributed through LMS. Along with a number of portals aiming to make life simpler by providing an extract of the overwhelming amount of information available, LMS has served as anchor points for navigating the Internet in the higher education sector. At the same time, it is apparent that, for many, current LMS mostly functions as course administration where lecturers have the ability to send messages to their class and for students to submit their assignments.²⁸

The eCampus programme

The eCampus programme is the Ministry of Education and Research's national signature programme that combines national services within video and collaboration with digital skills for flexible education. The programme aims to help public universities and university colleges establish good practice and utilise solutions for flexible education. eCampus will build infrastructure with a shared top-level architecture that facilitates various forms of organisation, teaching methods and collaborative solutions. During the project phase, (2012-2016), UNINETT has overall responsibility for the technical development, while the institutions have the academic and educational responsibility. One goal for eCampus is to implement simple, good ICT solutions that support large-scale learning. There is also a desire to promote user-driven innovation through good examples and provide the opportunity to make education available on the Internet on a grand scale.

Local eCampus activities at higher education institutions are important partners in this effort. Several pilot projects have been implemented, and a considerable amount of knowledge has been gathered about how web-based flexible education should be carried out. The challenge is moving from small pilots to large-scale use of web-based tools, both for campus education and purely web-based education. It is important for eCampus to contribute toward making ICT ubiquitous in learning. The desire is to use the programme to promote use of tools, and putting them in a context and have them interact with educational and organisational processes. It is therefore important to contribute to the development of digital proficiency in management and in professional circles, as well as contribute to good practice for the use of ICT in education and research. ICT skills must be linked to ICT architecture throughout. The fact that there is a connection between national solutions and

²⁷ Ness, Bjørn (2013) *Tilkoblet - en fortelling om Internett og Forskningsnettet i Norge* (Connected - a tale of the Internet and the Norwegian research network - transl. note)

²⁸ Norway Opening Universities (2012) *Digital tilstand i høyere utdanning 2011*. (Digital status of higher education 2011 - transl. note) Tromsø: Norway Opening Universities.

local ICT support is therefore a focus area for eCampus. The eCampus effort has e.g. led to the construction of cloud services and joint purchases on behalf of the higher education sector in line with Norwegian regulations.

5 MOOCs from 2008 to 2013: idealism and big business

5.1 What are MOOCs?

Massive Open Online Courses (MOOCs) are courses provided over the Internet. They are provided free of charge to a large number of people and are accessed by the user logging into a website and signing up.

MOOCs differ from traditional university studies, firstly by their open access. As a point of departure, participation merely requires an Internet connection. Secondly, MOOCs are characterised by scalability; the courses are organised so that they can easily be scaled in line with the number of participants.

The didactics of MOOCs is continuously developing. The courses are likely to use brief video teaching sequences, quizzes, variants of peer review and machine-graded *multiple choice* exams. The courses may also utilise user-generated learning and the course participants may be able to network amongst themselves, most likely by using various digital services for sharing and interaction.

The first courses given the term MOOC started in 2008. Over the following years, the MOOC concept has developed into a catch-all for somewhat different course forms, particularly in layman's terms. At the same time, the literature has been characterised by a somewhat heated debate about which characteristics are needed for a course to be called a MOOC, a debate that also involves claiming ownership of the term and phenomenon. Broadly speaking, the debate revolves around the content assigned to the various parts in the MOOC acronym. There are different opinions of what it means for a course to be *massive*. Some emphasise that the course must have a massive number of participants, others the growth potential due to the courses' scalability. An *open* course can be understood as a free course, or that the course is open to all by not requiring special previous knowledge. Many also link the openness criterion to learning resources, i.e. whether the course uses openly licensed or copyrighted academic content. *Online* may or may not entail that that entire learning processes take place synchronously. The *course concept* is also ambiguous. Certain people believe that there must be set start and end points. Others emphasise that the course leader role is given a certain content or that course participants must complete a concluding test and thus document what they have learned.

The Commission believes that much of the debate on MOOCs and similar provisions concerns scalability in the distribution part, i.e. that the courses can be made available to all those who want to participate without the costs increasing sharply when many participants join. The Commission believes the Norwegian discussion about MOOCs should, to a greater extent, include the entire education process linked to MOOCs, from course production to evaluation, and that it is crucial to consider the scalability of the individual elements in the process. The Commission believes that the education process is characterised by the following four key points:

- *Production*: producing the academic content to be used in the course. The main cost driver for this part is the amount of content to be produced, and what quality one aims for.
- *Distribution*: making MOOCs available to all those who want to participate. The technical costs here are low, and can be reduced further by economy of scale. If a large number of people are using the same system, the extra cost of delivering the course to one additional person is virtually insignificant compared to other parts of the value chains.
- *Follow-up and interaction*: follow-up and interaction between students, between students and advisers and between students and other resources. The cost drivers in

this phase are the number of students taking the course, and the cost may vary significantly depending on the type of course and type of follow-up that is planned.

- *Assessment*: a formal, verifiable assessment of whether the students have reached their learning objective. Traditional exam systems are within this phase, but are not the only option. The cost driver for this phase is the number of students who want an assessment, which is not necessarily the same as the number of students taking the course.

5.1.1 The Commission's interpretation of MOOCs

As described in Chapter 1.4, the Commission has chosen to use a broad definition of MOOCs in its work. This was done for two primary reasons: firstly, the Commission was asked through its mandate to assess MOOCs and similar provisions. This formulation does not indicate a strict definition. Secondly, the Commission is of the opinion that the rapid development in the field, where new services, new players and new business models are continuously emerging, make a strict definition unsuitable. MOOCs, as they appeared in 2008, are very different from the majority of MOOCs as they appear in 2013. The Commission therefore thinks there is a basis for believing that these courses will continue to develop in such a way that the diversity in what can be called MOOCs and similar provisions will increase. The Commission has determined that the benefit of its recommendations will be greatest by operating with a broad definition that emphasises the overall common features of MOOCs.

The Commission has chosen to emphasise the overall common features of MOOCs and similar provisions. In this report, the MOOC term is therefore used as a catch-all for courses with the following characteristics:

- Courses that are online
- Courses that are massive, i.e. scalable in relation to the number of participants
- Courses that are open, i.e. anyone can sign up for them

The Commission operates with the following clarifications of the three characteristics. The Commission takes a point of departure in courses that are online, but its work also includes courses with sliding transitions into what is called *blended learning*, which means studies that combine web-based and campus education. The Commission has also chosen to include courses with different degrees of openness, be it as regards course fees, qualification requirements and the use of learning resources. Finally, the Commission operates with a broad definition of courses. This includes not only short further education programmes, but also multi-year, credit-earning degrees with the other characteristics as described above.

5.2 The emergence of MOOCs

The term MOOC was first used in 2008 to describe an open online course at the University of Manitoba in Canada. The course was taken by 25 paying students from the university, in addition to 2 300 participants who took the course free of the charge over the Internet. The course yielded credits for the university students. All course content was available through *RSS feeds*, and the participants themselves had considerable freedom in choosing which platforms they wanted to use to participate, for example Facebook groups, wiki pages, blogs and forums. Over the following years, a number of others copied and modified this course structure, and several MOOCs were launched.²⁹

²⁹ Daniel, Sir John (2012) 'Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility', *Journal of Interactive Media in Education*. Available at: <http://jime.open.ac.uk/2012/18> (Accessed: 10 December 2013).

These first courses have subsequently been named cMOOCs in order to distinguish them from so-called xMOOCs. One important difference between the two is the educational approach in the courses. xMOOCs are largely an extension of the educational model practiced at the universities. Such courses are most often constructed around video of lecturers reviewing the curriculum, and are likely to contain various forms of testing. In broad terms, cMOOCs are based on the idea that learning ideally takes place in networks without a strict framework. Technology is here used as a tool to develop the networks and learning process according to the participants' desires and needs. The major attention in recent years surrounding MOOCs is primarily linked to the development and emergence of xMOOCs.

5.2.1 Learning theories and MOOCs

In a university education context, there are three main learning theories; behaviouristic, cognitive and sociocultural. A number of theories sort under each of these which extrapolate and develop key terms and perspectives. All three learning theories have been part of the MOOC development.

Behaviouristic learning theory presumes that knowledge is transferred from the lecturer and a pre-determined curriculum to students, where evaluation is primarily characterised by reproducing knowledge. There are multiple examples of MOOCs where video lectures and content dissemination have this characteristic; from one teacher to many students who receive and eventually reproduce knowledge in an exam.

Cognitive learning theory presumes that learning takes place in the individual. As opposed to behaviourism, the individual is here participating more actively in his/her own learning, and is characterised by individual problem and task solving. As regards the development of MOOCs, this means that students are actively engaged in task solving facilitated by teachers. Sociocultural learning theory presumes that learning takes place through interaction between lecturers and students, between students, and where the assessment forms are characterised by group work, R&D projects and portfolio assessment.

In recent years, MOOCs have also increased their emphasis on collaborative learning through the use of social media, developing communities of practice and knowledge production. Technology and societal development change our perspectives of learning and challenge traditional work methods, assessment forms, new theoretical approaches and organisational practice. Learning increasingly takes place in a context characterised by complexity and technology-dense social environments.

5.2.2 MOOCs from 2008 to 2013: a three-stage development

Cathy Sandeen from the American Council on Education (ACE) has summarised the development of MOOCs since the first courses were launched in 2008, and claims to be able to identify three unique phases.³⁰ The phase Sandeen calls MOOC 1.0 came about with the first Canadian courses and evolves when similar courses are established in the US. MOOC 1.0 is synonymous with the emergence of cMOOCs: connectivistic, open courses where the participants themselves had a significant amount of responsibility for the learning process.

MOOC 2.0 describes the phase where MOOCs develop into more standardised courses focusing on scalability. This is the phase where major platforms such as Coursera, Udacity and edX are established and collaboration is set up at elite institutions in the US. Courses developed under MOOC 2.0 often have no admission requirements, are preferably provided

³⁰ Sandeen, Cathy, Huffington Post (2013): *From Hype to Nuanced Promise: American Higher Education and the MOOC 3.0 Era*. Available at: http://www.huffingtonpost.com/cathy-sandeen/from-hype-to-nuanced-prom_b_3618496.html (Accessed: 11 December 2013).

free of charge, course participants have little contact with academic employees at the institution providing the course and the courses normally yield no credits. The majority of course participants are in, or have completed, higher education, and primarily join out of curiosity or interest. In MOOC 2.0, the platforms also experiment with models for offering credits for completed courses.

Sandeen believes that the field is now in the process of entering its final phase so far, MOOC 3.0. One key characteristic of this phase is that MOOCs are increasingly imported into the institutions, normally not as complete courses, but as elements used in the institution's own programmes of study. In MOOC 3.0, MOOCs are thus used more in traditional campus education, for example integrated in various *flipped classroom* models. *Flipped classroom* involves the students watching online lectures from home and using their time at the institution to continue working on the subject matter along with a teacher and/or fellow students. The literature appears to be in agreement with Sandeen in the description of the first two phases of MOOC development, but there is more disagreement linked to Sandeen's third phase, i.e. the question as to where MOOCs are now and where the development is headed in the near future.

5.2.3 Major platforms are established

In the autumn of 2011, three new MOOCs were launched by Stanford University, all of which helped put MOOCs on the agenda in earnest, both in the world of education and in society at large. Stanford professors Sebastian Thrun and Peter Norvig were the first to decide to offer their course "Introduction to Artificial Intelligence" free of charge over the Internet. Their course was designed to mimic a real classroom setting. The objective was to provide high-quality teaching and academic content to those who so desire. More than 160 000 students from more than 190 countries registered for the course, which made this the first course to actually reach out to a large audience. Weeks later, two additional courses were launched from Stanford University, this time by Andrew Ng and Jennifer Widom. As a result of the vast response to the courses, Thrun later established a company called Udacity, and Andrew Ng established Coursera in collaboration with Daphne Koller.³¹ Both companies are commercial ventures.

In the autumn of 2011, and with a basis in concern that the emergence of MOOCs represented a commercialisation of higher education over the Internet, the Massachusetts Institute of Technology (MIT) established the MITx platform. Harvard University later joined the venture, and the platform was rechristened edX. Later, the University of California, Berkeley, the University of Texas System, Wellesley College and Georgetown University also joined. Whereas Udacity and Coursera are independent, commercial initiatives, edX is a strategic initiative by the institutions themselves to seize the opportunities inherent in video-based xMOOCs.³²

Several major universities have announced that they intend to invest heavily in technology. For example, Harvard has established Harvardx, which is tasked with "... *supporting faculty innovation in the use of technology in testing and research on campus, online and beyond*".³³ Over the next five years, Harvard will invest close to NOK 30 billion in developing its programmes of study, on campus, online and *beyond*.

³¹ Marques, Juliana, Mooc news and reviews (2013) *A Short History of MOOCs and Distance Learning*. Available at: <http://moocnewsandreviews.com/a-short-history-of-moocs-and-distance-learning/> (Accessed: 11 December 2013).

³² Universities UK (2013) *Massive Open Online Courses: Higher Education's Digital Moment?* Available at: <http://www.universitiesuk.ac.uk/highereducation/Documents/2013/MassiveOpenOnlineCourses.pdf> (Accessed: 11 December 2013).

³³ Harvardx (2013). Available at: <http://harvardx.harvard.edu/> (Accessed: 11 December 2013).

December 2012 saw the founding of FutureLearn, the fourth major MOOC platform. FutureLearn is the first UK platform, and the controlling owner is the UK-based Open University. Whereas the three other platforms have partnered with the university sector, FutureLearn has also entered into a partnership with British Museum, British Council and British Library. One key element of the company's strategy is to build on the experience and expertise that already exist in Open University, which has long been an important player in the distance learning market.

Table 5.1: Characteristics of the four largest MOOC services³⁴

	Coursera	edX
Background	Originated from Stanford University. Launched in April 2012.	Originated from Harvard and MIT. First edX course launched in October 2012.
Portfolio (as of 2 October 2013)	452 courses. 88 partners. 5 001 381 registered course participants	75 courses. 29 partners. Reached 1 million registered users in June 2013.
Strategy	<p>Focused on rapid growth, both internationally and by providing courses in a number of different disciplines.</p> <p>Partnerships with elite and research-heavy institutions, institutions that are members of the Association of American Universities.</p> <p>Less centralised quality-assurance process, but reserves the right to remove content that does not satisfy their quality standard.</p>	<p>Lower pace in course and partnership development.</p> <p>Focus on high-ranking and research-heavy institutions.</p> <p>Partner institutions operate their own sub-platforms, but share the x suffix.</p> <p>Centralised quality-assurance process. Stronger focus on innovation in learning and teaching and integration in campus activity.</p>
Business model	<p>Commercial company. Financed by venture capital and certain partner universities.</p> <p>No advance costs for institutions, but the institutions can pay Coursera to manage content on the platforms.</p> <p>Depending on how long the courses are available on the platform, between 6 and 15 per cent of the earnings generated by Coursera go to the institutions, as well as 20 per cent of gross profits from all courses the institution offers through Coursera.</p>	<p>Non-profit company owned and financed by MIT and Harvard, with partial financing (philanthropic) from private entities.</p> <p>Two payment models.</p> <ol style="list-style-type: none"> 1. The institutions pay \$250 000 to publish courses on the platform, and receive 70 per cent of gross profits. 2. The institutions use the platform, but retain responsibility themselves (self-service model). The first \$50 000 goes to edX, then profits are split up to 50/50. <p>The course platform is available as open source code (Open edX).</p>
Certificates	<p>Course certificates issued by Coursera.</p> <p>Uses an exam system where students take an online exam, monitored by an impartial third party (<i>proctored examinations</i>), in collaboration with Pearson VUE.</p>	<p>Course certificates issued by sub-platform.</p> <p>Uses an exam system where students take an online exam, monitored by an impartial third</p>

³⁴ Based on Universities UK (2013) *Massive Open Online Courses: Higher Education's Digital Moment?* Available at: <http://www.universitiesuk.ac.uk/highereducation/Documents/2013/MassiveOpenOnlineCourses.pdf> (Accessed: 11 December 2013).

Online validation systems are under development.

party (*proctored examinations*), in collaboration with Pearson VUE.

	FutureLearn	Udacity
Background	Platform primarily owned by UK-based Open University. Founded in December 2012.	Originated from Stanford University. Founded in June 2011.
Portfolio (as of 2 October 2013)	20 courses starting in autumn 2013. 29 partners, including three that are not universities (British Museum, British Council, British Library).	28 courses, mostly within computer science and related technology subjects.
Strategy	Build on experience and expertise in Open University to provide quality education on a global scale.	Collaborate with individual academics and technology companies, including Google and Microsoft. Planning to maintain focus on technology subjects.
Business model	Owned and financed by Open University. No advance payment from institutions. Financial contributions from partner institutions to develop courses.	Commercial company. Partially financed by venture capital.
Certificates	Certificates from FutureLearn.	Certificates from Udacity. Uses an exam system where students take an online exam, monitored by an impartial third party (<i>proctored examinations</i>), in collaboration with Pearson VUE. Online validation systems are under development.

5.2.4 Other platforms and new collaborations

ALISON (Advance Learning Interactive Systems Online) was established in 2007, and some literature counts it as the first MOOC provider. ALISON's main focus is to provide free courses that make it easier to acquire basic education and skills that are relevant in the labour market, and also differs from the previously mentioned MOOC providers by its lack of association with university partners.³⁵

In November 2012, the education technology company Infrastructure launched the Canvas Network platform. Canvas Network distinguishes itself from the majority of MOOC platforms by putting greater emphasis on the opportunity to experiment with the course's educational structure, and with new ways to use multimedia elements.³⁶

In June 2013, the EU launched the OpenUpEd portal in collaboration with university partners in 11 countries. OpenUpEd has been called a European answer to the strong US dominance among major MOOC platforms, and was launched with the aims of contributing toward more open education, as well as having the institutions utilise more innovative and flexible teaching methods. Certain courses available through OpenUpEd yield certificates or badges, but there is increasing focus on courses that yield credits (*ECTS credits*).³⁷

³⁵ ALISON (2013). Available at: www.alison.com (Accessed: 11 December 2013).

³⁶ Nagel, David (2012) *Instructure Creates Free 'Canvas Network' for Online Courses*. Available at: <http://campustechnology.com/articles/2012/11/01/instructure-creates-free-canvas-network-for-online-courses.aspx> (Accessed: 11 December 2013).

³⁷ OpenUpEd (2013). Available at: <http://www.openuped.eu/> (Accessed: 11 December 2013).

The German MOOC provider iversity was launched in October 2013. Iversity has so far entered into partnerships with five universities, four of which are European. Out of a total of 24 courses, iversity offers three that yield credits (*ECTS credits*). In these courses, the students sit for traditional campus exams at the institutions that are responsible for the MOOCs.³⁸

In the autumn of 2013, edX announced that MIT, through its MITx sub-platform, would start offering course packages consisting of individual courses that collectively cover a larger subject. These packages can be viewed as an attempt to create MOOCs that mimic degree modules at the traditional institutions, and thus as an attempt to test a business model that provides a larger education module without depending on the courses yielding credits in the formal education system. The courses are free of charge, but students pay a fee of USD 100 per course to verify their identity. Many saw this business model as a response to Coursera's announcement a few weeks earlier that they had made USD 1 million in 2013 by selling verified tests to course participants.³⁹

In October 2013, edX also announced that it had entered into an agreement with China and France for these countries to use Open edX for their own, national MOOC portals. Open edX was launched the month before as a collaboration between edX and Google, and where the platform would be made publicly available through a joint open portal called mooc.org. This was also interpreted as another attempt to explore different business models. The countries pay a fee to edX for technical support and counselling on how to best use the portal.⁴⁰

Coursera Learning Hubs was launched in late October 2013 in collaboration with a number of partners, the most prestigious of which was the US State Department. Learning Hubs are physical locations, currently 24 places around the world, with Internet access, access to Coursera's course catalogue and local facilitators. Coursera aspires to increase the number of locations at a rapid pace.⁴¹

The figure below shows important events and players in the emergence and development of MOOCs and connections between them. This method of summarising the development of MOOCs is common in most literature: the strong connection toward OCW and OER, the first courses with a connectivistic approach, before the major platforms are established and the xMOOC format becomes dominant.

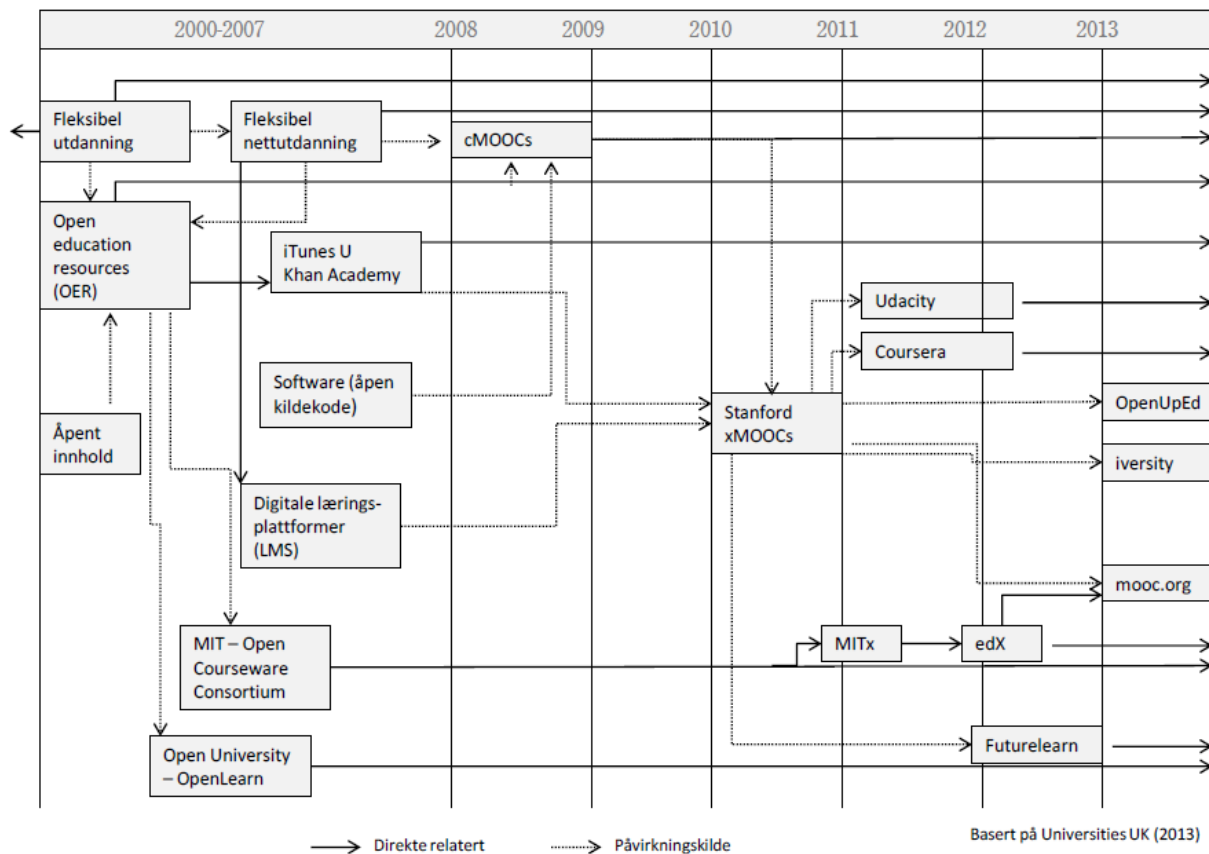
³⁸ Iversity (2013) Available at: <https://iversity.org/> (Accessed: 11 December 2013).

³⁹ Meyer, Robinson, The Atlantic (2013) *The Next Step on the Path to an Online-Only Education?* Available at: <http://www.theatlantic.com/technology/archive/2013/09/the-next-step-on-the-path-to-an-online-only-education/279799/> (Accessed: 11 December 2013).

⁴⁰ Meyer, Robinson, The Atlantic (2013) *Harvard and MIT's Online Education Startup Has a New Way to Make Money*, Available at: <http://www.theatlantic.com/technology/archive/2013/10/harvard-and-mits-online-education-startup-has-a-new-way-to-make-money/280700/> (Accessed: 11 December 2013).

⁴¹ Coursera Blog (2013) Available at: <http://blog.coursera.org/post/65596539008/introducing-coursera-learning-hubs-global> (Accessed: 11 December 2013).

Figure 5.1: Important milestones in the emergence of MOOCs



<Figure text:

Fleksibel utdanning = flexible education

Fleksibel nettutdanning = flexible online education

Åpent innhold = open content

Åpen kildekode = open source code

Direkte relatert = direct relationship

Påvirkningskilde = source of influence

Basert på Universities UK (2013) = Based on Universities UK (2013)>

5.2.5 Scope and propagation

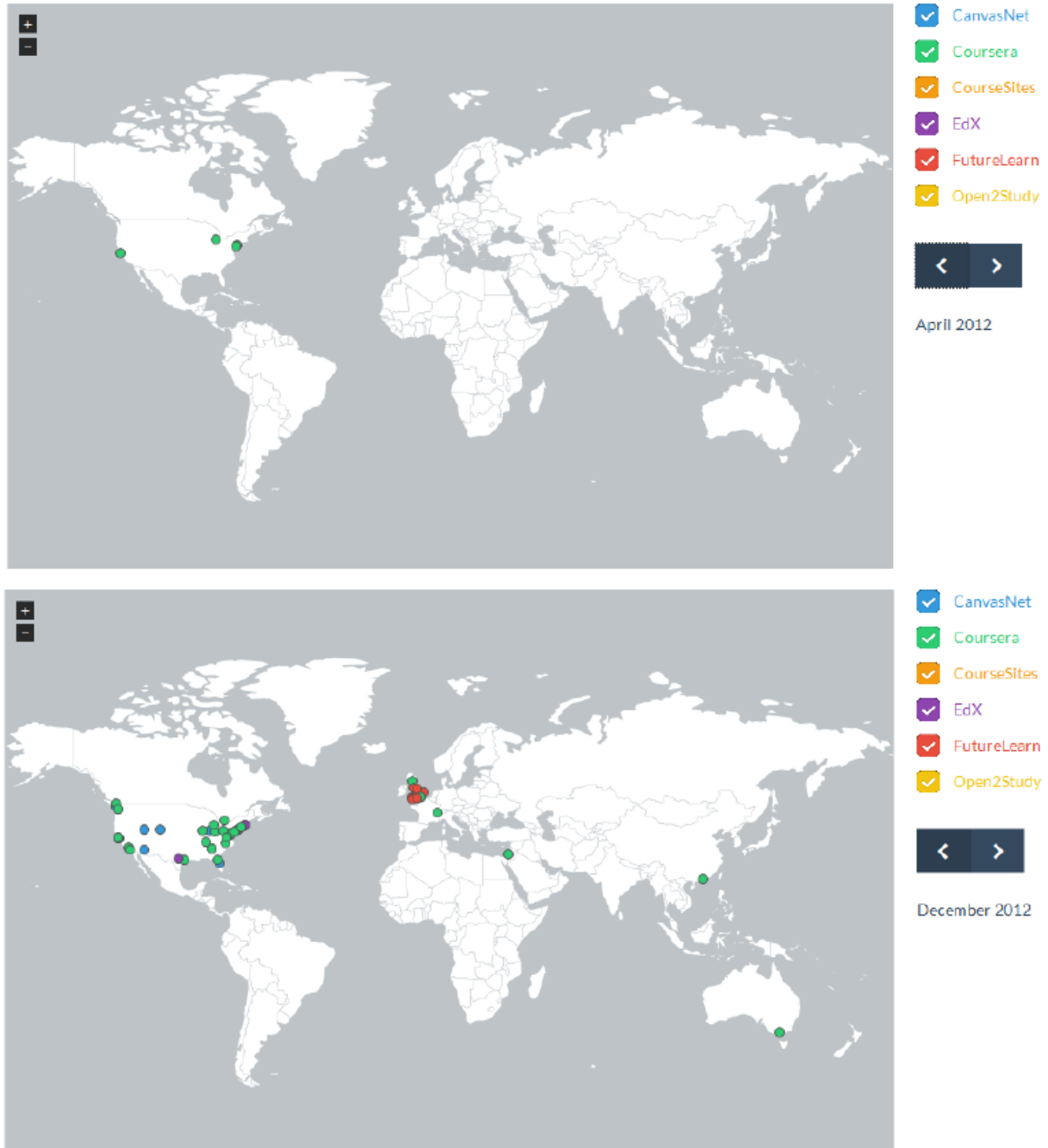
Following the launch of the above-mentioned MOOCs in the autumn of 2011 and the establishment of Coursera, Udacity, edX and other suppliers, the scope of and interest in MOOCs grew very rapidly. The New York Times named 2012 “The Year of the MOOC”. The maps below show part of this development. Whereas in April 2012, four US institutions had partnered with one of the major MOOC providers, this number had grown exponentially by December of the same year. In August 2013, the number had again grown by leaps and bounds, and institutions across most of the globe had partnered with a supplier.

The growth of Coursera, the largest and most celebrated MOOC providers, aptly illustrates the development that has taken place over the last few years. When the company was started in April 2012, Coursera was partnered with four US universities. In July of the same year, it partnered with 12 additional institutions, and in September it added another 17. In a blog post on 9 August 2012, Coursera writes that, four months after their launch, they have reached 1 million course participants from 196 countries.⁴² At this time, Coursera could

⁴² Coursera Blog (2013) *Coursera hits 1 million students across 196 countries*. Available at: <http://blog.coursera.org/post/29062736760/coursera-hits-1-million-students-across-196-countries> (Accessed: 11 December 2013).

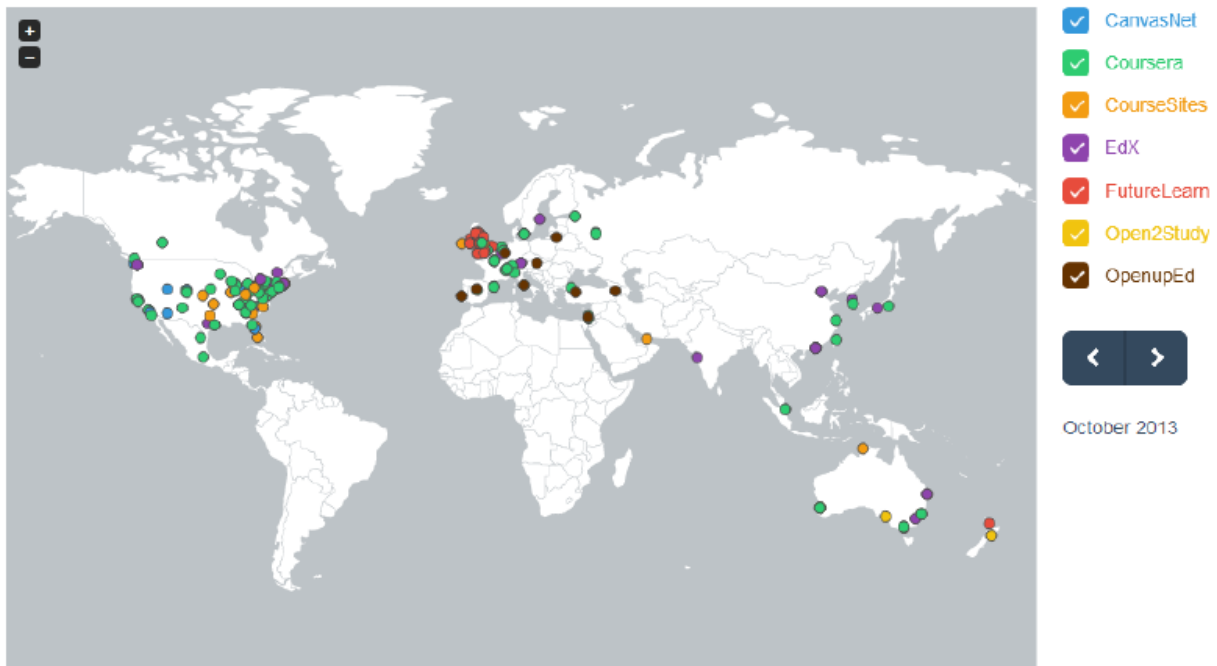
offer 116 different courses. In October 2013, approximately one year later, Coursera offers 452 courses from 88 different institutions. The number of participants has reached 5 million, which means that the company has gained an average of nearly 9000 new course participants daily during this period.⁴³

Figure 5.2: Institutions that have partnered with MOOC providers⁴⁴



⁴³ Coursera (2013). Available at: <https://www.coursera.org> (Accessed: 11 December 2013).

⁴⁴ Edutechnica (2013) *MOOC Map*. Available at: <http://edutechnica.com/moocmap/> (Accessed: 11 December 2013).



5.2.6 Crisis of higher education in the US

There are many driving forces behind the powerful emergence of MOOCs in recent years. One important driving force, and one that is often used as a partial explanation for why US players have such a strong position, is the early warning signs of a crisis of higher education in the US.⁴⁵

Many Americans who start higher education never finish a degree. An American student starting a four-year degree has a 57 per cent likelihood of finishing in six years, which is considerably lower than in countries such as the UK and Australia.⁴⁶ The US authorities estimate that 36 million Americans have *some college, no credential*.⁴⁷

Another warning sign is the significant cost growth in higher education. Since 1983, the individual student's tuition expenses has grown nearly five times the rate of inflation, which has made higher education accessible to fewer people and has increased the burden of debt considerably for those who start higher education. Tuition rose by more than eight per cent between 2010 and 2011. In the 2011/12 school year, the cost of four-year public colleges was USD 8 244 per year (*in-state*) and USD 20 770 (*out-of-state*). During the same period, in California, which is home to ten per cent of all US students, tuition rose by 37 per cent for two-year public colleges, and 21 per cent for four-year public colleges. Over the last 15 years, the average student loan debt per student has doubled, and the overall student loan

⁴⁵ The Economist (2012) *Higher education: Not what it used to be*. Available at: <http://www.economist.com/news/united-states/21567373-american-universities-represent-declining-value-money-their-students-not-what-it> (Accessed: 11 December 2013).

⁴⁶ The Economist (2012) *Higher education: Not what it used to be*. Available at: <http://www.economist.com/news/united-states/21567373-american-universities-represent-declining-value-money-their-students-not-what-it> (Accessed: 11 December 2013).

⁴⁷ Australian Trade Commission (Austrade) (2013) *More than MOOCs: Opportunities arising from disruptive technologies in education*. Available at: <http://www.austrade.gov.au/Education/News/Reports/More-than-MOOCs--Opportunities-arising-from-disruptive-technologies-in-education#.UqhR-2yx5dg> (Accessed: 11 December 2013).

debt in the US has been estimated at one trillion dollars. At the same time, financial aid per student has dropped to the lowest level in 25 years.⁴⁸

There have also been signs to indicate that people with higher education are faring worse in the labour market than before. In 2011, nearly ten per cent of student loan recipients who graduated two years earlier has defaulted on their student loan. Lower wages for new graduates over the last ten years (16 per cent for women and 19 per cent for men), combined with a larger debt burden, causes many young people to reconsider enrolling in higher education, and this in spite of research showing that those with higher education fare better over the course of their lifetime than those without.⁴⁹

The emergence of MOOCs in the US, and particularly xMOOCs with video-based courses that can easily be scaled up, is often mentioned as a response to this development. The crisis in US higher education has piqued the interest of companies and investors that see opportunities in a new market. They will invest in new education models and new technology to improve higher education. In 2011, investments in education technology reached one billion dollars, nearly seven times the level five years before. During the 2010-2012 period alone, venture investments in education technology grew from USD 82 million to 189 million.

5.2.7 The emergence of MOOCs outside North America

In the spring of 2013, Enterasys, an international network provider, carried out what they call a *worldwide survey* of MOOC trends in higher education. The survey found that 13 per cent of the polled institutions offer MOOCs, 43 per cent plan to offer MOOCs within three years, while 44 per cent have no plans.⁵⁰

In October, 2013, the International Council for Open and Distance Education (ICDE) conducted a survey aimed at management at their member institutions in order to gain an overview of MOOCs. They found that 37 per cent of respondents claimed to have one or more MOOCs, 44 per cent plan to launch one over the next six to twelve months, while 18.6 per cent have no plans. The survey also shows that, over a three-to-five-year perspective, 20.5 per cent of respondents believe that MOOCs will have a transformative effect on higher education, 75 per cent believe MOOCs will find their place as part of online education and 4.6 per cent believe MOOCs will not be viable in education.

Asia

The Chinese authorities have developed an aggressive strategy for the use of IT in its country's further development, and the education authorities have also put IT at the top of their agenda. Internet access will be provided through broadband to all schools, digital teaching resources in all classes and web-based learning for all. Education will be facilitated through a national public platform for digital education resources and a platform for education information administration. Higher education institutions, along with the Ministry, will organise a MOOC initiative. The education institutions will be given financial support for this, and courses will be made available free of charge to all citizens.

⁴⁸ Australian Trade Commission (Austrade) (2013) *More than MOOCs: Opportunities arising from disruptive technologies in education*. Available at: <http://www.austrade.gov.au/Education/News/Reports/More-than-MOOCs--Opportunities-arising-from-disruptive-technologies-in-education#.UqhR-2yx5dg> (Accessed: 11 December 2013).

⁴⁹ The Economist (2012) *Higher education: Not what it used to be*. Available at: <http://www.economist.com/news/united-states/21567373-american-universities-represent-declining-value-money-their-students-not-what-it> (Accessed: 11 December 2013).

⁵⁰ Nilson, Robert, Enterasys (2013) *Trends in Massive Open Online Courses*. Available at: <http://blogs.enterasys.com/trends-in-massive-open-online-courses-infographic/> (Accessed: 11 December 2013).

A group of Chinese universities, in cooperation with the authorities, have partnered with edX. Several universities are launching courses through Coursera. However, the development appears to be on hold while the authorities clarify their policy as regards MOOCs. The Open University of China, which is the headquarters of 47 autonomous universities, has also started working on MOOCs.

In the rest of Asia, several individual institutions have started producing MOOCs. Australia was an early adopter, and Open Universities Australia has launched its own portal, Open2Study, which offers both free and accredited courses.

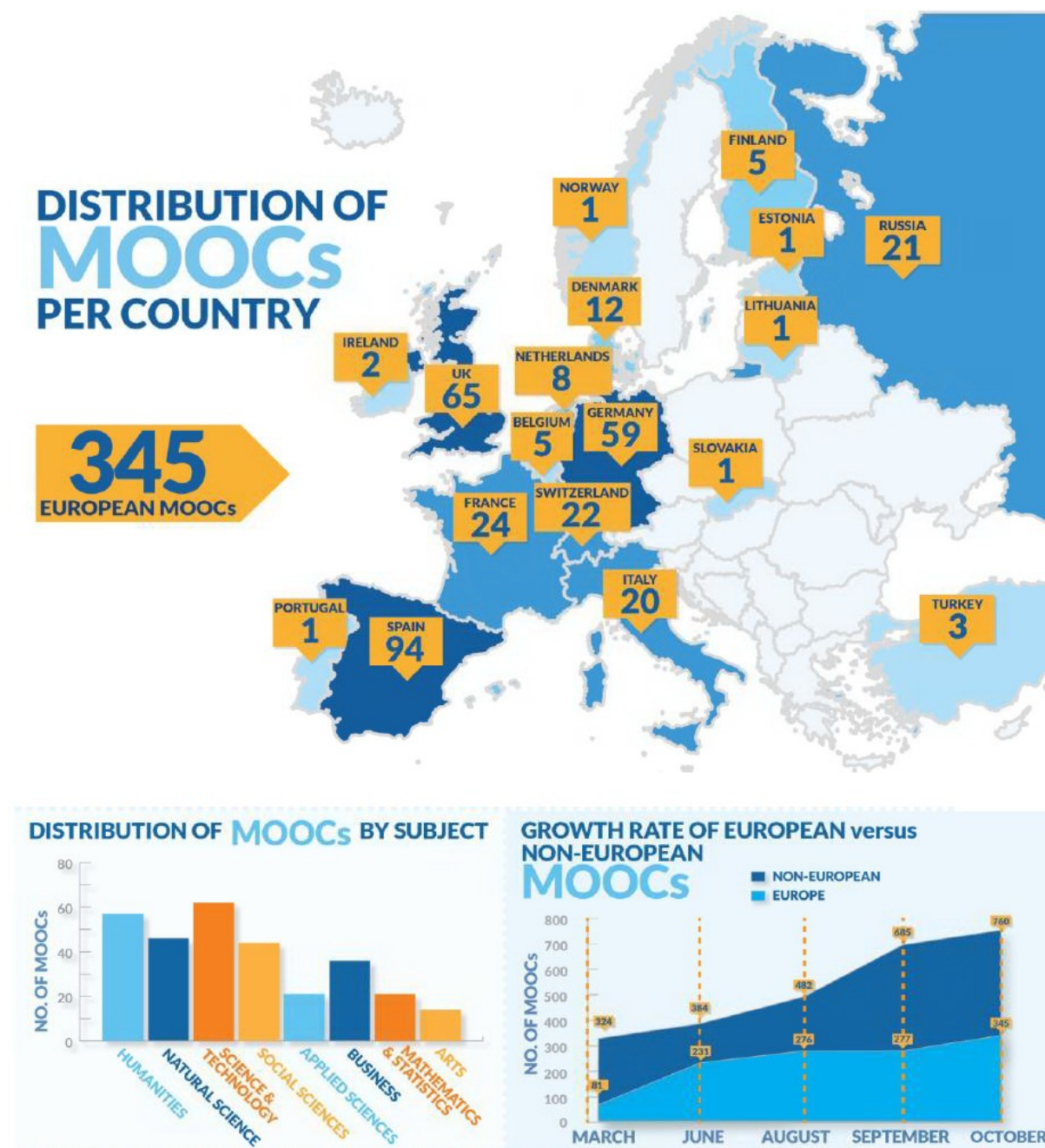
South America and Africa

There have been no extensive MOOC developments in either South America or Africa. One exception is Brazil, where the Veduca portal has been launched. Veduca offers courses in Portuguese from a number of universities around the world.

Europe

Apart from North America, MOOC developments appear to be most mature in Europe. The propagation of MOOCs in Europe is aptly illustrated by the European MOOCs Scoreboard. The overview shows European MOOCs by country, by subject and as a ratio of all registered MOOCs, regardless of MOOC platform.

Figure 5.3: European MOOCs by country, by subject and as a ratio of all registered MOOCs. As of 31 October 2013⁵¹



As previously mentioned, several European MOOC platforms have been established. The UK's FutureLearn, the EU initiative OpenUpEd and Germaniversity are the most familiar. Other platforms include the Spanish Miranda X, as well as OpenHPI and OpenCourseWorld in Germany.

France was the centre of attention in the autumn of 2013, when it presented a plan for the use of ICT in higher education. The plan aims to motivate more higher education institutions to develop more web-based services for students and teaching personnel. The plan also aims to help French universities and colleges perform on the international MOOC market. The

⁵¹ Open Education Europa (2013) *European MOOCs Scoreboard*. Available at: http://openeducationeuropa.eu/en/european_scoreboard_moocs (Accessed: 11 December 2013).

goal is for all French students to have access to web-based courses within the next few years, and to be able to receive a diploma or a type of certification through a MOOC within five years. The overall objective is for increased use of web-based teaching to lead to better completion rates at universities, particularly at the bachelor's level, as well as stimulate more people to take higher education. One of the most important measures in the plan is the establishment of a joint web portal for universities that provide web-based services or MOOCs. The new web portal, France Université Numérique (FUN), will, as previously mentioned, use the edX platform.⁵²

Over the course of 2013, Russian higher education institutions have been discussing how to deal with MOOCs: whether to ignore the trend, use existing MOOC platforms or develop their own. In October, it was then confirmed that three Russian universities have joined the Coursera platform and are the first Russian institutions on the map of global web-based education. The three are the Moscow Institute of Physics and Technology (MFTI, corresponds to a science-based college), St. Petersburg State University (SPbGU) and the Higher School of Economics (VSE). VSE will offer twelve MOOCs in early 2014, primarily within economics. The courses are offered in both English and Russian.⁵³

Nordic countries

Developments in the Nordic countries have much in common with the development in Norway: no centrally managed initiatives so far, but there is activity at the institution level. Institutions in both Sweden and Denmark offer courses through the large US platforms. Karolinska Institutet offers MOOCs through edX. In Denmark, several universities offer courses through Coursera. In Finland, the University of Helsinki has the most experience, and has worked on MOOCs since 2010. Coursera also placed one of its first 30 "Learning Hubs" in Helsinki.⁵⁴

5.2.8 MOOCs in Norway

The first Norwegian MOOCs were produced in 2013. The Commission has learned that several institutions are in the process of establishing MOOCs and similar provisions, and a number of institutions are considering the possibility of producing such courses. A few examples illustrate the development and status of MOOCs in Norway.

Norway's first MOOC was started in September 2013 at NTNU. The course "Teknologiendring og samfunnsutvikling" (technology change and societal development - transl. note) is offered in four different variants, from the free version without an exam (MOOC) to an ordinary continuing education course with physical meetings for students. About 900 students follow the course, which makes this the largest further education course NTNU has ever had. The course uses the Canvas learning platform.⁵⁵

Work is under way at the University of Bergen to develop a purely web-based course in natural resource management. The "Natural resources management" course was first offered in the spring of 2013 and uses video lectures, a lot of graphics, animation, simulations and games to help students learn. The ambition is to drive the students forward,

⁵² France Université Numérique (2013). Available at: <http://www.france-universite-numerique.fr/> (Accessed: 11 December 2013).

⁵³ Edutainme (2013). Available at: <http://www.edutainme.ru/post/na-coursera-poyavilis-kursy-rossiyskikh-vuzov/> (Accessed: 11 December 2013).

⁵⁴ Coursera (2013). Available at: <https://www.coursera.org/about/programs> (Accessed: 11 December 2013).

⁵⁵ NTNU (2013) *Norges første MOOC åpnes i dag.* (Norway's first MOOC opens today - transl. Note) Available at: <http://www.ntnu.no/aktuelt/pressemeldinger/13/mooc-apning> (Accessed: 11 December 2013).

similar to a video game. The course is aimed at international, as well as Norwegian students.⁵⁶

At Lillehammer University College, teaching personnel are involved in the MOOC “Open Online Experience”.⁵⁷ The course is aimed at teachers and teaching personnel at all levels who want continuing education in digital skills. The service is network-based and is founded on connectivistic learning theory, the principles behind so-called cMOOCs. Lillehammer University College has also partnered with the University of Karlstad and the Swedish National Agency for Education on the online course “Bedömning och betyg årskurs 4-6” (assessment and grades - years 4-6 - transl. note), which at the time writing has 2000 enrolled teachers. The course is located on a newly-established Scandinavian MOOC platform, Lifelong Learning Web. Norwegian courses have also been developed in “Assessment for learning” and “Digital storytelling”.⁵⁸

The University of Oslo is planning a MOOC version of examen philosophicum (mandatory introductory course in philosophy - transl. note), FlexPhil, and start-up is scheduled for the autumn of 2014. The course will contain videos, quizzes, multiple-choice tests and a study guide.⁵⁹ The Centre for Development and the Environment at UiO is also working on a MOOC to be offered in the autumn of 2014. The course will be based on the master’s degree course “What works? Success stories in international development”. The course is intended to recruit participants on a global scale.

The Norwegian University of Life Sciences has started taking the first steps toward implementing MOOCs, by streaming MATH100 and STAT100 lectures and making the video lectures available online for free after the classes. Exams will be held as normal in these subjects.

Molde University College has established an open course platform called HiMoldeX, on which all lectures and course materials in ten subjects are made openly available. These subjects include information technology, mathematics and statistics. The University College uses YouTube and the open part of Fronter for this provision.⁶⁰

5.3 MOOC participants

Many people have pointed out that one important driver behind the MOOC development in recent years has been a strong convergence between available technology and demand in the education market, which in turn means that more people enrol in courses via the Internet. Forty-six per cent of US college students that have graduated over the last ten years have followed online classes. Thirty-nine per cent of all adults who have taken such courses believe that the value of this type of education is equal to that of traditional campus education. A recent survey also shows that 49 per cent of all Americans, and 61 per cent of everyone in the 18-30 age group, believed that the quality of online education was comparable to the quality of campus education.⁶¹

⁵⁶ UiB (2013) *Natural Resources Management*. Available at: <http://www.uib.no/utdanning/evu/evutilbud/natural-resources-management> (Accessed: 11 December 2013).

⁵⁷ Open Online Experience (2013) *What is Digital Citizenship?* Available at: <http://www.ooc13.org/> (Accessed: 11 December 2013).

⁵⁸ Lifelong Learning Web (2013). Available at: <http://www.llw.se/enrol/index.php?id=12> (Accessed: 11 December 2013).

⁵⁹ UiO (2013) *Flexphil er på vei*. (Flexphil on the way - transl. note) Available at: <http://www.hf.uio.no/ifikk/studier/aktuelt/aktuelle-saker/2013/flexphil.html> (Accessed: 11 December 2013).

⁶⁰ HiMoldeX (2013). Available at: <http://himoldex.no/> (Accessed: 11 December 2013).

⁶¹ Australian Trade Commission (Austrade) (2013) *More than MOOCs: Opportunities arising from disruptive technologies in education*. Available at: <http://www.austrade.gov.au/Education/News/Reports/More-than->

At the same time, a recent survey among nearly 110 000 undergraduate students at universities in 47 US states and 14 countries has shown that very few have participated in a MOOC over the last year; three per cent in the US, four per cent in Canada and six per cent in the rest of the world.⁶² The survey also showed that nearly 75 per cent of the polled students did not know what a MOOC was.

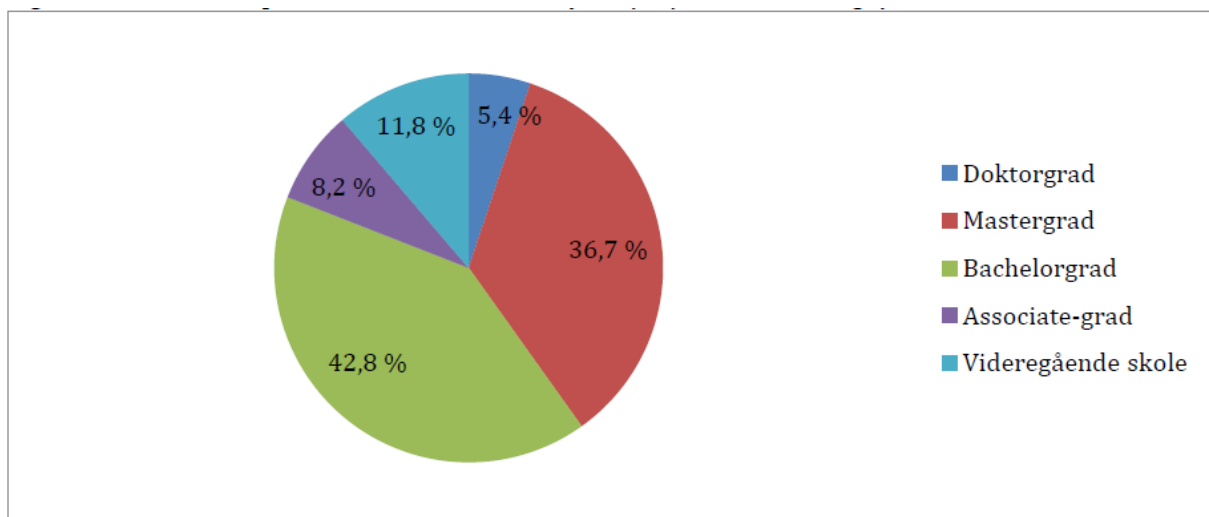
5.3.1 Who are the participants?

MOOCs are still very popular. The number of courses and institutions that offer courses has increased considerably, without resulting in few students per course. Even though few courses now have more than 100 000 registered participants, as was the case with some of the early ones, typical xMOOCs still have between 20 000 and 60 000 registered students.⁶³

There is a limited amount of data available on participants in MOOCs and their backgrounds. A review of literature that mapped peer-reviewed articles on MOOCs during the 2008-2012 period included 45 articles. Some of these concerned the participants' background and experiences, but they all had a limited data basis. Much of the knowledge we currently have on participants in MOOCs therefore originates from the major MOOC providers, often published in blog posts in the form of infographics.

Coursera has repeatedly published statistics on the educational background of those who follow their MOOC services. As of January 2013, the distribution was as follows:⁶⁴

Figure 5.4: Participants in MOOC services by highest completed education, January 2013. Coursera.



[MOOCs--Opportunities-arising-from-disruptive-technologies-in-education#.UqhR-2yx5dg](#) (Accessed 11 December 2013).

⁶² Dahlstrom, Eden et al (2013) *ECAR study and Undergraduate Students and Information Technology*.

Available at: <https://net.educause.edu/ir/library/pdf/ERS1302/ERS1302.pdf> (Accessed: 11 December 2013).

⁶³ Universities UK (2013) *Massive Open Online Courses: Higher Educations Digital Moment?* Available at: <http://www.universitiesuk.ac.uk/highereducation/Documents/2013/MassiveOpenOnlineCourses.pdf> (Accessed: 11 December 2013).

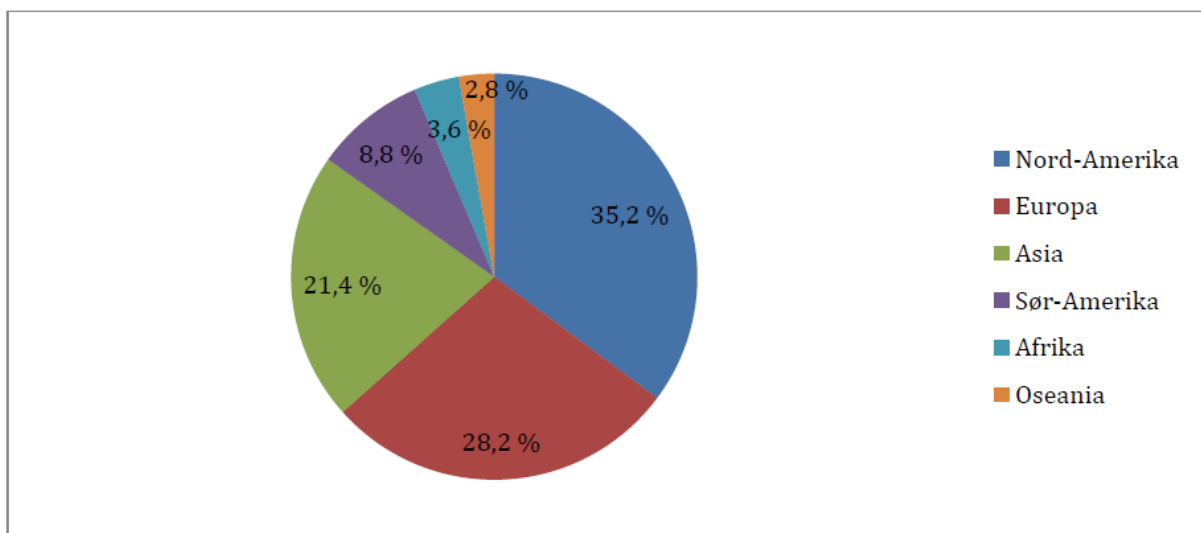
⁶⁴ Universities UK (2013) *Massive Open Online Courses: Higher Educations Digital Moment?* Available at: <http://www.universitiesuk.ac.uk/highereducation/Documents/2013/MassiveOpenOnlineCourses.pdf> (Accessed: 11 December 2013).

<Figure text:
 Doktorgrad = PhD
 Mastergrad = master's degree
 Bachelorgrad = bachelor's degree
 Associate-grad = associate degree
 Videregående skole = upper secondary school>

In October 2013, the University of Pennsylvania published the highlights of a survey they had carried out among students participating in the 32 MOOCs offered by the university through Coursera. The data include nearly 35 000 students from more than 200 countries and territories, and shows that most course participants were highly educated men who were taking MOOCs to develop their career. The participants generally had considerably higher level of education than what is the norm in the country or territory they were from. This tendency was particularly strong for participants from Brazil, Russia, India, China and South Africa, where almost 80 per cent of course participants were from the richest six per cent of the population.⁶⁵

Data from Coursera shows that course participants come from all over the world, but that the majority are located in North America, Europe and Asia. Corresponding data from edX and Canvas largely support this impression.

Figure 5.5: Participants in MOOCs by continent, January 2013. Coursera.



A report from early 2013 concluded that MOOC students are a far more heterogeneous group than those who pursue a traditional degree: some are currently working and want to top off with more knowledge, some are scientists who utilise OER e.g. in their own teaching, some are learning new things in their spare time, some are future students, while others are students who are already in higher education and also follow MOOCs.⁶⁶

⁶⁵ Fowler, Geoffrey A., The Wall Street Journal (2013) *Survey: MOOC Students Are Elite, Young and Male*. Available at: <http://blogs.wsj.com/digits/2013/11/20/survey-mooc-students-are-elite-young-and-male-2/> (Accessed: 11 December 2013).

⁶⁶ Universities UK (2013) *Massive Open Online Courses: Higher Education's Digital Moment?* Available at: <http://www.universitiesuk.ac.uk/highereducation/Documents/2013/MassiveOpenOnlineCourses.pdf> (Accessed: 11 December 2013).

5.3.2 Motivation for taking MOOCs

Researchers at Duke University have analysed data from their first MOOCs. The data show that the MOOC participants' motivation for enrolling in courses can be organised into four different categories:⁶⁷

- Lifelong learning or achieve an understanding of a topic, without any particular expectation to complete or proof of goal achievement
- For fun, entertainment, social experience and intellectual stimulation
- For practical purposes, often in connection with barriers toward traditional education alternatives
- To experience/explore web-based education

Some participants (15 per cent) used the course to determine whether they wanted to apply for admission to traditional university studies, while ten per cent believed they could not afford the alternative, i.e. traditional education. Edinburgh University has the same type of experience. The main reason given by participants in the university's six first courses was curiosity as regards MOOCs and web-based learning, as well as a desire to learn about new subjects. Career and documentation were less important as motivation. The participants' motivation was clearly more geared toward exploration than a means to an end.⁶⁸

5.3.3 Participants' involvement in MOOCs

Based on three MOOCs in computer science, Stanford's Lytics lab has identified four main groups of participants:⁶⁹

- *Auditing learners*: follow lectures, but are otherwise inactive
- *Completing learners*: complete most assignments in the course
- *Disengaging learners*: complete assignments at the start of the course, but disengage in whole or in part during the course
- *Sampling learners*: briefly explore the course by sampling some of the content

The three courses that formed the basis for the analysis were at three different levels: upper secondary (*high school*), *undergraduate* studies and *graduate* studies. The number of students falling within the four different categories varied between the three courses. The upper secondary-level course has a considerably higher number of completing learners (about 25 per cent) than the two other courses (about five to ten per cent).

Phil Hill has developed a similar four-pronged approach. Hill distinguishes between active participants (take all parts of the course, participate in discussions, etc.), passive participants (consume content, but are otherwise inactive), *drop-ins* (follow parts of the course, but not all) and lurkers (those who only observe and try out a few parts).⁷⁰

⁶⁷ Belanger, V. & Thronton, J. (2013) *Bioelectricity: A Quantitative Approach – Duke University's First MOOC*. Available at:

http://dukespace.lib.duke.edu/dspace/bitstream/handle/10161/6216/Duke_Bioelectricity_MOOC_Fall2012.pdf (Accessed: 11 December 2013).

⁶⁸ University of Edinburgh (2013) *MOOCs @ Edinburgh 2013 – Report #1*. Available at:

<http://www.era.lib.ed.ac.uk/bitstream/1842/6683/1/Edinburgh%20MOOCs%20Report%202013%20%231.pdf> (Accessed: 11 December 2013).

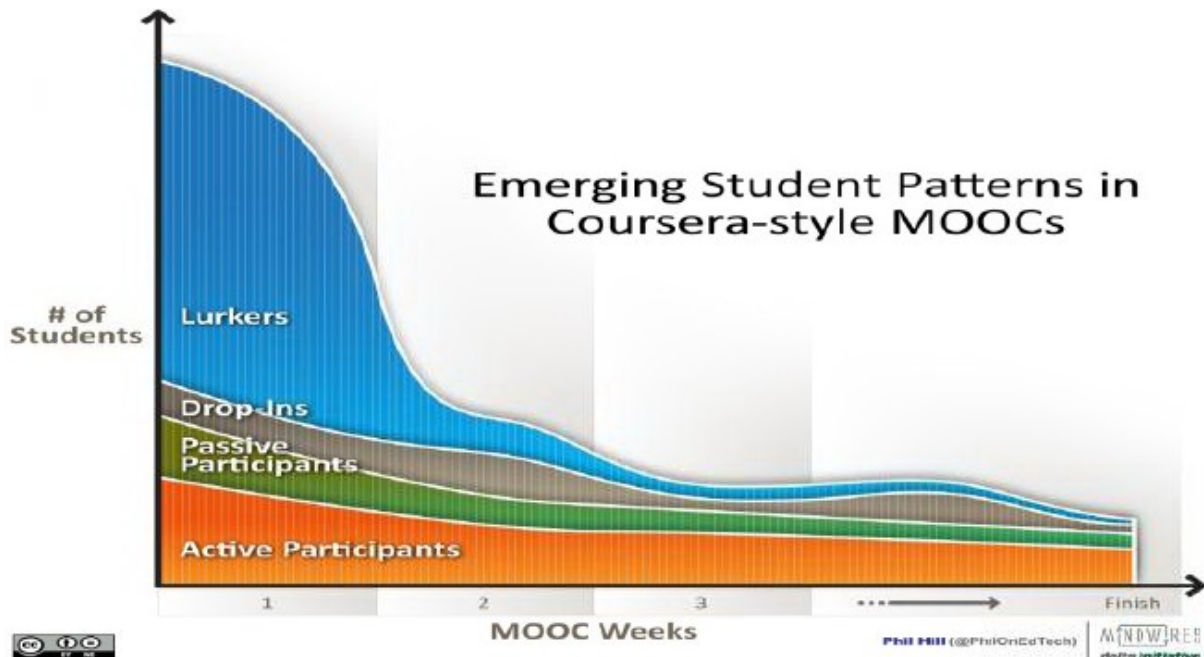
⁶⁹ Kizilcec, René m.fl. (2013) *Deconstructing Disengagement: Analyzing Learner Subpopulations in Massive Open Online Courses*. Available at: <http://lytics.stanford.edu/deconstructing-disengagement/> (Accessed: 11 December 2013).

⁷⁰ Hill, Phil (2013) *Emerging Student Patterns in MOOCs: A Graphical View*. Available at:

http://mfeldstein.com/emerging_student_patterns_in_moocs_graphical_view/ (Accessed: 11 December 2013).

Based on this typology, Hill has aggregated available data for what he calls Coursera-style MOOCs (read: xMOOCs). This yields a characteristic distribution of the students, as shown in the figure below.

Figure 5.6: Types of learners in MOOCs.



Vanderbilt University has had similar experience with its three first MOOCs. Out of a total of 23 000 to 43 000 students in the different courses, 78 per cent or more followed videos in the course. The more work and effort that was needed in the various types of assignments in the course, the fewer people would participate. In one course, seven per cent received a completed course confirmation, in the two others this was 15 and 16 per cent. Experience from these courses e.g. shows that differences in background and knowledge are much more prevalent than in traditional courses. Vanderbilt believes it can conclude that MOOC participants are motivated, but that there are significant differences in motivation between different groups of participants. Experience from Vanderbilt also shows that MOOC participants largely produce knowledge, which is linked to the fact that technology enables more than passive consumption of knowledge.⁷¹

Edinburgh University, the first university in the UK to offer Coursera courses, has analysed data from more than 300 000 people who registered for the six first MOOCs offered by the university.⁷² Even though the courses were offered through Coursera, the learning models were closer to cMOOCs, with the use of videos and discussions in social forums online (e.g. Google Hang-outs). The university has carried out a survey among 45 000 students at the start of the courses and 15 000 at their conclusion. The data materials have multiple weaknesses, and contain significant trend variation within and between different courses. However, certain common features are clear.

⁷¹ Bruff, Derek, Center for Teaching, Vanderbilt University (2013) *Lessons Learned from Vanderbilt's first MOOCs*. Available at: <http://cft.vanderbilt.edu/2013/08/lessons-learned-from-vanderbilts-first-moocs/> (Accessed: 11 December 2013).

⁷² University of Edinburgh (2013) *MOOCs @ Edinburgh 2013 – Report #1*. Available at: <http://www.era.lib.ed.ac.uk/bitstream/1842/6683/1/Edinburgh%20MOOCs%20Report%202013%20%231.pdf> (Accessed: 11 December 2013).

Firstly, they discovered a considerable drop in participation in all courses from registration to the first week of the course. Out of the total of 300 000 who enrolled, 42 per cent were active during the first week of the course. In week three, a total of 40 000 assignments were submitted. In week seven this had dropped to about 10 000 assignments. However, participation patterns after course start varied significantly between the six courses. The main reasons for participating were curiosity as regards MOOCs and web-based learning, as well as a desire to learn new subjects. Career and documentation were less important. In other words, they discovered, as in other analyses, that the students' motivation was clearly more explorative than a means to an end. Edinburgh University also found a high level of satisfaction with the courses. Only three per cent of those who completed believed they had not benefited as desired. One key observation in the analysis is that the attitudes, skills and motivation of MOOC participants has more in common with lifelong learning students than degree students.

The analyses of participant patterns show that the number of participants who complete MOOCs is low. The available literature on MOOCs is approaching a debate on whether the low completion rate is proof that MOOCs are not an effective learning model. The prevailing opinion appears to be that it is too early to make this conclusion. Stephen Downes, who was behind the first course named MOOC, believes Stanford's typology approach as to MOOC participants' behaviour demonstrates that completion is too narrow a metric of whether MOOCs are suitable and effective or not, precisely because this metric overlooks the participants' motivation and reason for participating. Many participate out of curiosity, rather than to achieve documentation of completed study.⁷³

5.3.4 What ensures good learning in MOOCs?

There is currently little information available on the learning effects of MOOCs. Two recent studies provide a few preliminary indications.

Educause Center for Analysis and Research (ECAR) has carried out a study among students in undergraduate studies. The study found that students preferred forms of *blended learning* when they experimented with utilising MOOCs. The study showed that the students wanted face-to-face contact with teachers, even if they have the opportunity to interact online. This is in line with a recent meta-analysis that examines the effects of integrating technology in higher education.⁷⁴

A survey carried out by Columbia University found that the fail and drop-out rate was considerably higher (32 versus 19 per cent) in a course offered online than in the equivalent course offered with physical meeting points between participants and academic employees. At the same time, San Jose State and edX found that the fail percentage fell from 45 to 9 per cent in an experiment where elements from an online version of the course Circuits and Electronics were incorporated into the campus version of the course. The analysis of the same course found a weak correlation between the number of posts contributed by participants in the course's discussion forum and the result achieved by the course participants. This may indicate that learning outcomes improve along with involvement and participation in the course. San Jose State and edX also found that the time participants

⁷³ E-Literate (2013) *Insight on MOOC student types from ELI Focus Session*. Available at: <http://mfeldstein.com/insight-on-mooc-student-types-from-eli-focus-session/> (Accessed: 11 December 2013).

⁷⁴ Dahlstrom, Eden et al (2013) *ECAR study and Undergraduate Students and Information Technology*. Available at: <https://net.educause.edu/ir/library/pdf/ERS1302/ERS1302.pdf> (Accessed: 11 December 2013).

spent working independently in connection with the course had a considerably larger impact on outcomes than the time participants spent watching the course videos.⁷⁵

5.3.5 Learning Analytics

The vast amounts of data generated by MOOCs and other learning platforms represent new opportunities for analysis and research on student learning. *Learning Analytics* is an emerging field of research that revolves around analysing these data to improve learning and teaching. For example, one of edX's goals is to carry out experiments to explore how students learn, and how digital tools and different teaching methods can improve learning.

The research network Society for Learning Analytics Research (SoLAR) has defined learning analytics as "...the measurement, collection, analysis and reporting of data about learners and their contexts, for purposes of understanding and optimizing learning and the environments in which it occurs".⁷⁶ Learning analytics can help provide individually tailored teaching, identify students who are at risk of disengaging and optimise the benefit of digital teaching materials. According to the NMC Horizon Report, learning analytics will be one of the most important technological changes within education over a four-to-five-year perspective.

There are multiple forms of learning analytics. For example, in predictive analytics, one uses collected data on demographics, previous outcomes and activity during the course to calculate the likelihood of the student passing. The calculations are used to target measures at the students who need them most. The goal is to improve the completion rate. One example is the Signals project at Purdue University.⁷⁷ In the analysis of social networks one can analyse connections between people in a social context, and thus analyse learning activity in a discussion forum. One example of this is SNAPP.⁷⁸ Using discourse analysis, the researchers have developed methods to analyse the quality of student contributions in the digital learning activity.

5.4 Recognising skills gained from MOOCs

How skills gained through MOOCs are documented varies along with the modes of delivery. Internationally, the development is headed in two main directions. One where established universities accept MOOCs on par with their own campus-based studies and where there is a link to credit systems. The other direction explores alternative ways to recognise skills. In addition to these two extremes, we find various forms of MOOCs that are used as supplements to the regular content of a degree programme – for example the use of MOOCs in different forms of *blended learning*.

5.4.1 The development of MOOCs with credits and MOOCs as part of degree programmes

On an international basis, established institutions are becoming more accepting of MOOC studies in line with their own campus-based studies. There have been a number of examples of this in recent years, particularly in the US. In September 2012, Colorado State University, as the first higher learning institution, accepted the Stanford course Artificial Intelligence

⁷⁵ Fowler, Geoffrey, A., The Wall Street Journal (2013) *An Early Report Card on Massive Open Online Courses*. Available at: <http://online.wsj.com/news/articles/SB10001424052702303759604579093400834738972> (Accessed: 11 December 2013).

⁷⁶ SoLAR, Society for Learning Analytics Research (2013). Available at: <http://www.solaresearch.org/mission/about/> (Accessed: 11 December 2013).

⁷⁷ Purdue University (2009) *Signals tells students how they're doing even before the test*. Available at: <http://www.purdue.edu/uns/x/2009b/090827ArnoldSignals.html> (Accessed: 11 December 2013).

⁷⁸ SNAPP (2011). Available at: <http://www.snappvis.org/> (Accessed: 11 December 2013).

taken through Udacity as a credit-earning course.⁷⁹ In October of the same year, Antioch University entered into a licensing agreement with Coursera in order to use courses from Duke University and the University of Pennsylvania in their curriculum.⁸⁰ In 2013, the University of Maryland University College has offered credits to those who complete, or who can document that they have learned from, MOOCs.⁸¹ In January 2013, Udacity launched a pilot in collaboration with San Jose State University with three MOOCs that would earn the students credits if they finished. While Udacity was responsible for technological platform and assistance to the academic staff who taught the course, lectures in the courses were given by professors at the university.⁸²

The American Council on Education (ACE) has entered into collaboration with Udacity where they want to evaluate MOOCs in relation to college credits, and to see how this form of study can best contribute toward the students' learning. This is one of ACE's research and evaluation measures toward assessing the academic potential of MOOCs, which started in November 2012.⁸³ In February 2013, the American Council on Education's College Credit Recommendation Service (ACE CREDIT) evaluated five Coursera courses and recommended that they become credit-earning. ACE thus advised its 1 800 academic member institutions that the courses were of such quality that the institutions could award credits to students who had completed them. ACE later recommended awarding credits for four courses from Udacity and one from edX. The institutions decide for themselves whether to follow the recommendation.⁸⁴ In June 2012, Udacity established a partnership with Pearson VUE for testing and certification of students, so that students who want to receive a certificate can undergo an examination.⁸⁵ edX has entered into a similar agreement.

In May 2013, Udacity announced that they would partner with the telecommunications company AT&T and Georgia Institute of Technology to offer the first MOOC-based master's degree programme, a master's in computer science. The degree in computer science from Georgia Institute of Technology is popular among students and graduates have traditionally been in demand in the labour market. Whereas tuition for the campus-based master's degree programme amounts to more than USD 40 000, the university now offers a MOOC-based version for USD 7 000 – 80 per cent cheaper.⁸⁶

⁷⁹ Mangan, Katherine, *The Chronicle of Higher Education* (2012) *A First for Udacity: a U.S. University Will Accept Transfer Credit for One of Its Courses*. Available at: <http://chronicle.com/article/A-First-for-Udacity-Transfer/134162/> (Accessed: 11 December 2013).

⁸⁰ Kolowich, Stewe, *Inside Higher Ed* (2012) *MOOCs for Credit*. Available at: <http://www.insidehighered.com/news/2012/10/29/coursera-strikes-mooc-licensing-deal-antioch-university> (Accessed: 11 December 2013).

⁸¹ Bishop, Tricia, *The Baltimore sun* (2013) *Maryland college offering credit for massive open online courses*. Available at: http://articles.baltimoresun.com/2013-09-04/news/bs-md-mooc-20130815_1_moocs-umuc-higher-education (Accessed: 11 December 2013).

⁸² Faine, Paul, *Inside Higher Ed* (2013) *As California Goes?* Available at: <http://www.insidehighered.com/news/2013/01/16/california-looks-moocs-online-push> (Accessed: 11 December 2013).

⁸³ ACE (2013) *ACE to Forge New Ground in MOOC Evaluation and Research Effort*. Available at: <http://www.acenet.edu/news-room/Pages/ACE-to-Forge-New-Ground-in-MOOC-Evaluation-and-Research-Effort.aspx> (Accessed: 11 December 2013).

⁸⁴ Kolowich, Steve, *The Chronicle of Higher Education* (2013) *American Council on Education Recommends 5 MOOCs for Credit*. Available at: <http://chronicle.com/article/American-Council-on-Education/137155/>

⁸⁵ Udacity Blog (2012) *Udacity in partnership with Pearson VUE announces testing centers*. Available at: <http://blog.udacity.com/2012/06/udacity-in-partnership-with-pearson-vue.html> (Accessed: 11 December 2013).

⁸⁶ Onink, Troy, *Forbes* (15.05.2013) *Georgia tech, Udacity Shock Higher Ed With \$7,000 Degree*. Available at: <http://www.forbes.com/sites/troyonink/2013/05/15/georgia-tech-udacity-shock-higher-ed-with-7000-degree/> (Accessed: 11 December 2013).

Another example is the new Open Educational Resources University (OERu). This is a partnership consisting of 31 institutions from e.g. the US, Australia and New Zealand, that started in November 2013. Students that finish online, free courses through OERu institutions, can pay to have their work assessed as credits. The credits will be recognised as part of a degree at one of the institutions in the partnership. The Director of the New Zealand-based organisation behind the initiative, believes the access to credits will make OERu more attractive than other forms of MOOCs.⁸⁷

5.4.2 Legislation linked to accreditation of MOOCs

In 2013, the state of California initiated a legislative amendment that would obligate universities in the state to give credits for MOOCs delivered by third party providers. The objective was to establish a system where students who have trouble being admitted to certain undergraduate programmes in high demand, could take approved online courses from providers outside the state's higher education system. A faculty council would be tasked with identifying 50 courses of this type; courses that most students need in order to satisfy general education requirements. The council would then determine which of these courses should be included in the system.⁸⁸ The legislative amendment is currently on hold, in part due to many unanswered questions.⁸⁹

In the summer of 2013, the Governor of Florida signed a bill which entails that MOOCs, under certain circumstances, can be used to help teach K-12 students⁹⁰ in four subjects. The bill also means that students will have the opportunity to use MOOCs to take credit-earning courses that will count when they apply for college.⁹¹

At the same time, a number of congressmen at the federal level in the US have a desire to reform the accreditation system in the "Higher Education Act". The background is a desire to see more innovation in the use of web-based education. Another argument is that federal funding of higher education has not kept up with new approaches to higher education. The Republican Senator Mike Lee has stated that he is planning a bill that will give state authorities the opportunity to establish their own accreditation systems. States, along with the US Department of Education, will prepare agreements that will trigger federal funding for course providers, including providers other than traditional higher education institutions. The Senator also believes it should be possible to achieve accreditation for specialised programmes, individual courses, skills-based tests and hybrid models with both campus and non-campus-based elements.

Potential legislation will require new funding for higher education, or will come at the expense of existing funding. In the latter case, this will entail redirecting funds from traditional institutions toward a broader scope of providers. Many people are sceptical to the proposal. The Council for Higher Education Accreditation (CHEA) has stated that more competition is good, but they urge caution. Among other things, CHEA points out that state-level accreditation as an alternative to the current federal system, may result in authorities rather than academic employees making decisions on e.g. academic content. Senator Mike

⁸⁷ Times Higher Education (2013): 'MOOC rival puts accreditation 'beef' on menu'. *Times Higher Education* 31 October 2013.

⁸⁸ The Chronicle of Higher Education (2013) *California's Move Toward MOOCs Sends Shock Waves, but Key Questions Remain Unanswered*. Available at: <http://chronicle.com/article/California-Considers-a-Bold/137903/> (Accessed: 11 December 2013).

⁸⁹ Kolowich, Steve, The Chronicle of Higher Education (2013) *California Puts MOOC Bill on Ice*. Available at: <http://chronicle.com/blogs/wiredcampus/california-puts-mooc-bill-on-ice/45215> (Accessed: 11 December 2013).

⁹⁰ K-12 is used as a collective term for primary and secondary education.

⁹¹ Inside Higher Ed (2013) 'Watered Down' MOOC Bill Becomes Law In Florida. Available at: <http://www.insidehighered.com/quicktakes/2013/07/01/watered-down-mooc-bill-becomes-law-florida> (Accessed: 11 December 2013).

Lee's proposal is also only one of many simmering proposals in the debate surrounding potential reform of the "Higher Education Act". Many people are concerned with promoting emerging forms of web-based education, but most would prefer a less radical direction than what is represented by Senator Lee's proposal.⁹²

5.4.3 Other forms of skill recognition

Badges represent one example of alternative forms of skill recognition. Badges are a web-based manifestation of a skill, interest or ability one has learned.⁹³ The ability or skill may be acquired through a number of different channels, for example web-based games, MOOCs, courses, participating in networks, interests or involvement. Badges can be created and issued by anyone and can e.g. be shared on websites, blogs, online communities, social media, portfolios and CVs.

An ever-increasing number of players now offer various forms of badges. Khan Academy, Coursera and edX offer badges as documentation of completed courses and course achievement.⁹⁴ According to WCET, badges represent a new way to embody and certify areas of expertise and knowledge in many different professions and many different sectors.⁹⁵ In September 2013, WCET launched a MOOC in order to study badges as a new form of professional recognition, along with Mozilla, Blackboard Inc. and Sage Road Solutions LLC.⁹⁶

Through the Mozilla Open Badges project, a number of collaboration partners are attempting to establish thorough, verifiable documentation of abilities and skills, regardless of where they have been learned: in school, in society, at work or online.⁹⁷ The objective is to create new opportunities for students and employees, as well as allow employers to identify candidates with the skills needed in today's fluid labour market through a standard for badges. According to Mark Surman, Executive Director of Mozilla, the Internet opens up radical new approaches to learning. Open Badges are part of this. They allow people to display their skills anywhere. Anne Derryberry, one of the people behind the MOOC badges service, believes that badges will be a way to get unemployed, underqualified people employed in well-paid vacant positions.⁹⁸ According to the US Secretary of Education Arne Duncan, badges may change the focus from "sit-in time" to actually acquired knowledge and skills.⁹⁹ He claims that, in today's technology society, education not only can, but should, take place anytime and anywhere, and that we should recognise these skills.

Apart from Mozilla's Open Badges, several different providers and models have sprung up for digital documentation of skills acquired outside the traditional education institutions. Udacity recently partnered with e.g. Khan Academy and Google to create the Open Education

⁹² Fain, Paul, Inside Higher Ed (2013): *Time to Change the Rules?* Available at:

<http://www.insidehighered.com/news/2013/11/01/calls-washington-streamlined-regulation-and-emerging-models#ixzz2jNkKUPAQ> (Accessed: 11 December 2013).

⁹³ OpenBadges (2013). Available at: <http://www.openbadges.org/about/> (Accessed: 11 December 2013).

⁹⁴ Khan Academy (2013) *Badge types*. Available at: <https://www.khanacademy.org/badges>; edX (2013) *ID Verified Certificates of Achievement*. Available at: <https://www.edx.org/verified-certificate> (Accessed 11 December 2013).

⁹⁵ Learning Solutions Magazine (2013) *MOOC: Badges as New Currency for Credentials*. Available at: <http://www.learningsolutionsmag.com/articles/1230/mooc-badges-as-new-currency-for-credentials> (Accessed: 11 December 2013).

⁹⁶ PR Web (2013) *WCET to Launch MOOC on "Badges as New Currency for Professional Credentials*. Tilgjengelig fra: <http://www.prweb.com/releases/2013/8/prweb10993464.htm> (Hentet: 11. desember 2013)

⁹⁷ OpenBadges (2013). Available at: <http://www.openbadges.org/> (Accessed: 11 December 2013).

⁹⁸ PR Web (2013) *to Launch MOOC on "Badges as New Currency for Professional Credentials*. Available at: <http://www.prweb.com/releases/2013/8/prweb10993464.htm> (Accessed: 11 December 2013).

⁹⁹ US Department of Education (2011) *Digital Badges for Learning*. Available at: <http://www.ed.gov/news/speeches/digital-badges-learning> (Accessed: 11 December 2013).

Alliance.¹⁰⁰ The objective of the alliance is to connect employers and education institutions in order to educate the labour force of tomorrow, as well as provide documentation of these skills. Degreed.com offers people the opportunity to create their own profile with a digital overview of credits earned from various education institutions and web-based learning resources.¹⁰¹ On Smarterer.com one can take web-based tests in order to document one's skills.¹⁰² StraighterLine offers a subscription service for student courses, where course credits can be used at their ever-increasing number of accredited partner institutions.¹⁰³ In June 2013, former president Bill Clinton, through the Clinton Global Initiative, launched a "Commitment to Action" in order to massively increase access to Open Badges.¹⁰⁴ Codecademy provides free online courses in coding, while also planning to establish a job applicant service.¹⁰⁵ They have also entered into an agreement with a department at New York University to teach their students in how to write code.¹⁰⁶

These various digital solutions are now being met by parts of the traditional education system in that greater emphasis is placed in acquired skills, rather than completion time. The university that perhaps has gone the furthest in this line, is Western Governors University, which now offers skill-based degrees without any link to *credit hours*.¹⁰⁷

Certain employers have expressed that graduates from universities and colleges do not have adequate skills and that it is difficult to find out what a diploma actually means.¹⁰⁸

5.5 The MOOC debate

In September 2013, the UK Department for Business, Innovation & Skills published a review of available documentation on the development of MOOCs.¹⁰⁹ In addition to gathering published research on the topic, the report also reviews the recent years' debate on MOOCs as it has emerged in various sources.

The report puts particular emphasis on the debate between participants from academia. Here the report finds that a majority believe that, at the present time, MOOCs will not

¹⁰⁰ Udacity (2013) *The Open Education Alliance*. Available at: <https://www.udacity.com/opened> (Accessed: 11 December 2013).

¹⁰¹ Degreed (2013). Available at: <http://degreed.com/> (Accessed: 11 December 2013).

¹⁰² Smarterer.com (2013). Available at: <http://smarterer.com/> (Accessed: 11 December 2013).

¹⁰³ Straighterline (2013). Available at: <http://www.straighterline.com> (Accessed: 11 December 2013).

¹⁰⁴ Hastac (2013) *President Clinton Announces Commitment to Create New Pathways to College and Career Success Through Open Badges*. Available at: <http://www.hastac.org/news/president-clinton-announces-commitment-create-new-pathways-college-and-career-success-through-o> (Accessed: 11 December 2013).

¹⁰⁵ Codecademy (2013). Available at: <http://www.codecademy.com> (Accessed: 11 December 2013).

¹⁰⁶ New York University (2012) *NYU Teams Up with Codecademy to Promote Digital Literacy*. Available at: <http://www.nyu.edu/about/news-publications/news/2012/09/24/nyu-teams-up-with-codecademy-to-promote-digital-literacy.html> (Accessed: 11 December 2013).

¹⁰⁷ Inside Higher Ed (2013) *Beyond the Credit Hour*. Available at: <http://www.insidehighered.com/news/2013/03/19/feds-give-nudge-competency-based-education>; (2012) *Competency Based Education May Get Boost*. Available at: <http://www.insidehighered.com/news/2012/10/01/competency-based-education-may-get-boost> (Accessed: 11 December 2013).

¹⁰⁸ Fisher, Karin, The Chronicle of Higher Education (2013) *A College Degree Sorts Job Applicants, but Employers Wish It Meant More*. Available at: <http://chronicle.com/article/The-Employment-Mismatch/137625/#id=overview>; EPCE (2013) *Online Energy Education*. Available at: <http://epceonline.org>; Manufacturing Institute (2013) *NAM-Endorsed Manufacturing Skills Certification System*. Available at: <http://www.themanufacturinginstitute.org/Skills-Certification/Skills-Certification.aspx> (Accessed: 11 December 2013).

¹⁰⁹ UK Department for Business, Innovation and Skills (2013) *The Maturing of the MOOC*. BIS Research Paper number 130. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/240193/13-1173-maturing-of-the-mooc.pdf (Accessed: 10 December 2013).

radically change the education sector by making traditional institutions obsolete, but rather that such courses will gradually change the education landscape. The literature review also finds many who believe we are facing a disruptive innovation that will bring about major changes in the sector.

Among academics who take a positive view of the emergence of MOOCs, such courses are viewed as a natural consequence of major challenges in US higher education. In an education system with a low completion rate, which means that students enter the labour market with a very high debt burden, web-based courses are a welcome alternative. Many therefore see the emergence of MOOCs as a natural innovation in the education market, an innovation similar to those that have appeared in the publishing industry.

Others point out that MOOCs are important in order to elevate the quality of web-based courses. A recurring theme is that the majority of current MOOCs are better in terms of quality than the first courses called MOOCs. This is primarily because current MOOCs are largely adapted to meet the needs of the average campus student in order to succeed in his/her studies. Current MOOCs are more integrated with established distance learning provisions and campus education, and in many instances yields results in the form of credits.¹¹⁰ One final group of participants in this debate have primarily been concerned with the fact that MOOCs offer a new and necessary arena for self-teaching, and in the opinion of this group, represent a needed course correction for traditional institutions.

In an article, John Daniel lists a number of critical objections to the emergence of xMOOCs,¹¹¹ several of which are aimed at the key players in this recent development. Among other things, Daniel points out that the elite institutions behind many of the most popular courses available through the major xMOOC platforms are elite institutions due to their research efforts, and that there is little to indicate that they are at the forefront as regards web-based education. Daniel also believes that many of the players have little concern for the students' benefit from the courses. Furthermore, he is critical as regards the value of the accreditation offered by the courses, and particularly certificates issued by Coursera. Daniel argues that there are organisations with extensive experience in accrediting web-based learning, and that they are far better equipped to certify knowledge acquired through distance learning.

The article also contains critique of the xMOOC providers' educational basis. Daniel believes that the educational science forming the basis for such courses is not new, but in reality a behaviouristic educational approach that is already outmoded. Finally, Daniel also raises criticism against the xMOOC providers' philanthropic motivation behind disseminating free knowledge to the masses. According to Daniel, the opportunity to make a profit is the real motivation behind the developments in recent years.

Many have also been concerned with the fact that the democratising effect of MOOCs, where knowledge is now more readily available to those interested around the world, is not as strong as the proponents claim. Firstly, and in line with the argument that strong financial interests are behind recent years' developments, many MOOCs have a course fee. Secondly, and as a result of the way in which courses are produced and distributed, effective use of MOOCs presumes a familiarity with technology and experience with using digital services. In other words, this argument is based on the assumption that MOOCs will bring about a

¹¹⁰ UK Department for Business, Innovation and Skills (2013) *The Maturing of the MOOC*. BIS Research Paper number 130. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/240193/13-1173-maturing-of-the-mooc.pdf (Accessed: 10 December 2013).

¹¹¹ Daniel, Sir John (2012) 'Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility', *Journal of Interactive Media in Education*. Available at: <http://jime.open.ac.uk/2012/18> (Accessed: 10 December 2013).

similar effect that can be observed in other forms of knowledge and skill acquisition: the provision primarily leads to an acceleration in differences, in that those who already have knowledge and skills will acquire additional knowledge and skills.

Other critics have emphasised that the types of courses offered through platform such as Coursera cannot teach the participants the more complex skills education is meant to instil, for example critical thinking and creativity. Many have also pointed out that mass teaching, as expressed through the xMOOC platforms, cannot deal with the fact that participants have different needs. The courses and learning processes they prescribe follow a rigid template that can be effective for some participants, but not all.

The Commission has noted that, so far, there has been no major debate on MOOCs in Norway. However, the Commission expects this debate to grow in the time to come.

PART II
THE COMMISSION'S ASSESSMENTS

6 What may the emergence of MOOCs entail for Norwegian higher education?

6.1 Introduction

The emergence of MOOCs and similar provisions is, in the opinion of the Commission, a clear sign that different groups of learners, including traditional campus students, are requesting more flexible programmes of study where technology is an integrated part of the programmes. The Commission takes a positive view of MOOCs and similar provisions, i.e. other forms of web-based provisions or provisions that combine web-based and campus education. The Commission believes that Norway should utilise the potential of MOOCs as a supplement to or part of Norwegian higher education. In order for Norway to exploit this potential, the authorities and higher education sector must implement strategic and academic measures.

6.2 Innovative education and quality development

In Chapter 6.5, the Commission discusses how MOOCs can be incorporated as part of Norwegian degree programmes, subject to the quality and quality-assurance requirements that will thus apply. However, MOOCs are far more than a type of provision intended to be part of formal higher education, both from the provider's and students' perspective. In this chapter, the Commission will assess the quality of MOOCs at a general level, including quality-assurance of MOOCs and more content-oriented educational assessments of MOOCs and teaching quality. These are issues the Commission will continue to work on in its final report.

6.2.1 MOOCs provide new educational opportunities

Chapter 5.2.1 refers to learning theories that have been part of the MOOC development. Educational practice is challenged in entirely fundamental ways through the opportunities created by technology development, both through access to information and content in various forms, through different ways to approach subject matters and through the communicative and social sides of the use of digital technology. Educational research has documented that earlier visions of how technology development will be able to revolutionise educational practice are far from coming to fruition.¹¹² The most significant challenge has long been to move from a dissemination-oriented model for web-based courses to a more social constructivistic model that emphasises student's involvement in their own learning, and collaborative learning as an important social dimension of learning. The development of social media and new technology creates opportunities to involve students more in their own learning. So far, the development of a methodology for how to best utilise this has not been fruitful. The development represents a perspective shift in educational models for higher education, the contours of which have yet to emerge. The development has been very rapid and the Commission presumes that this is only the beginning of a trend that may take different directions.

The Commission has come to the conclusion that new digital opportunities support a diversity of learning methods that will provide learners with more and better opportunities to develop their potential. In order for Norwegian higher education to utilise the educational opportunities represented by MOOCs, the Commission believes there is a need for strategic measures in two areas in particular: systematic and research-based knowledge development concerning the learning aspects of technology development, as well as the development of digital proficiency among personnel in the sector.

Developing knowledge in the use of technology in learning

In the opinion of the Commission, there is clearly a significant need for more research in the educational and learning aspects of technology development within higher education. It is important to have systematic and research-based knowledge development, both to contribute

¹¹² Cuban, L. (1986) *Teachers and machines: The classroom use of technology since 1920*. New York: Teachers College Press; Erstad, Ola (2010) *Digital kompetanse i skolen* (digital proficiency in school - transl. note) (2nd edition). Oslo: Universitetsforlaget

toward reciprocal learning between academic environments and for academic and economic resources to be used as effectively as possible. The Commission believes that there are a number of challenges of an educational nature linked to MOOCs that must be considered. This e.g. concerns the question of quality in web-based versus face-to-face teaching, whether all student groups will handle new teaching methods equally well, how to facilitate those who want to face challenges, as well as whether digital forms of learning and MOOCs can function equally well within all disciplines. The Commission believes there are a number of important, general topics that must be included in such an educational assessment. This concerns the role of the student, role of the teacher, collaborative learning, learning that takes the individual's needs into consideration, digital teaching resources, assessment forms and various forms of flipped classrooms and blended learning. Examples of relevant specific topics that may be interesting for further study include the learning benefit from participating in various types of MOOCs, the effect of the use of MOOCs on education quality, as well as new assessment forms such as peer review and digital exams. The significance of big data as a basis for learning analytics in connection with teaching and learning is another relevant field. The Commission believes there is a need for strategic measures in the form of funds for such knowledge development.

One way to do this would be to establish a learning analytics environment. As mentioned in more detail in Chapter 5.3.5, learning analytics is an emerging field of research that deals with analysing data on students' learning in order to improve learning and teaching. Such an environment may be tasked with stimulating systematic and research-based knowledge development and using knowledge transfer to contribute toward learning analytics being implemented in Norway. Knowledge transfer in this area will be important in order to develop the institutions' desire and ability to develop courses and utilise the opportunities represented by MOOCs and other technologies to raise the quality of higher education. The Commission recommends establishing a learning analytics environment in 2015, with an allocation of about NOK 15 million annually.

Digital proficiency among personnel

Digital tilstand 2011¹¹³ shows that, so far, the institutions are not expending a lot of resources on developing lecturers' proficiency in varied use of ICT to promote student learning. New technology will challenge the teacher's educational skills and knowledge of learning. One may question whether the current minimum requirements for educational skills in the higher education sector will be adequate in order to keep up with the development taking place in the education area, manifested by the rapid spread of MOOCs. The higher education sector uses a limited amount of incentives at the individual level as regards teaching development. This is e.g. reflected in the Norwegian Association of Higher Education Institutions' instructive guidelines on promotion to professor level for a number of disciplines, where there is a minimum requirement for educational skills in order to teach in the individual subjects.¹¹⁴ This does not stimulate and motivate the utilisation of new technology and new teaching methods. The Commission therefore recommends a review of the general range of policy instruments and incentive schemes for the education area at the individual, institution and national level. These must be coherent and pull in the same direction.

The Commission therefore believes it is entirely necessary to strengthen digital proficiency as regards teaching for personnel in the higher education sector. It is important that academic staff have experience with developing educational plans using ICT that stimulate learning activities that can contribute toward increased education quality. They must develop knowledge and experience in utilising tools, resources and services provided by the technological infrastructure.

¹¹³ Norway Opening Universities (2012) *Digital tilstand i høyere utdanning 2011*. (Digital status of higher education 2011 - transl. note) Tromsø: Norway Opening Universities.

¹¹⁴ Norwegian Association of Higher Learning Institutions (2013) *Veiledende retningslinjer for professoropprykk* (instructive guidelines for professor promotions - transl. note). Available at: <http://www.uhr.no/ressurser/veiledninger/opprykksordninger> (Accessed: 11 December 2013).

A learning analytics environment may play an important role in the development of these skills. We propose allocating an annual NOK 10 million for the development of digital proficiency for employees in the higher education sector.

6.2.2 Quality-assurance of MOOCs

Norwegian web-based education in general have currently developed quality-assurance systems. When private university colleges apply for accreditation of web-based studies, the quality assessment is based on learning outcome descriptions (pursuant to the qualifications framework). xMOOC-style provisions have many features in common with web-based education, while cMOOC-style provisions are more challenging because the quality of these courses largely depends on contributions from participants. How to incorporate this type of studies into established quality-assurance systems, is a challenging question. In the opinion of the Commission, the emergence of MOOCs therefore highlights a need to look at the quality-assurance of web-based education in general. The importance of quality-assurance has also been emphasised by the fact that the volume of web-based education is increasing through MOOCs.

In many ways, MOOCs without exams and credits can be viewed as an arena for “informal learning”; in other words, courses that are not part of Norwegian degree programmes. Here, other types of quality assessment will be relevant. There are many examples of recognised skills development systems outside the higher education system, for example in major corporations such as McDonald’s, Kiwi and Microsoft. New forms of certification and recognition of skills are emerging on the international level. Badges are a clear example of this, cf. Chapter 5.4.3. The Commission believes that this development will accelerate in the years to come.

At the same time, the Commission is of the opinion that only a limited number of parallel quality-assurance and skills recognition systems should be developed. Skills that are currently outside the qualifications framework and the formal education system can take many forms, and there is a need for a comprehensive assessment of the state of affairs. Different forms of skills must be assessed in an international context. Norwegian authorities must therefore work closely with European initiatives and organisations linked to quality-assurance of education, and consider skills issues in the context of the systems that have been constructed around the current quality-assurance system and international skills recognition.

In this connection, the Commission wants to point out the fact that, in Norway in 2013, a separate commission has been appointed to assess skills outside the formal education system, with particular focus on how they can be incorporated into the national qualifications framework. This commission was appointed by the Ministry of Education and Research and is tasked with assessing whether there are particular challenges associated with education deliveries offered on an international scale or in parallel in multiple countries by corporations, industries, organisations, etc. The MOOC Commission believes that MOOCs without exams and credits fall within this type of deliveries, and that this commission must therefore also consider MOOCs as part of their work.

6.2.3 The Commission’s recommendations

- The Commission recommends a systematic focus on research-based knowledge development in ICT and learning.
- The Commission recommends establishing an environment for research-based knowledge development and knowledge transfer linked to learning analytics starting in 2015, with an annual appropriation of NOK 15 million. The structure and form must be assessed in relation to the current players and range of instruments.
- The Commission believes that the higher education sector is using a limited amount of incentives at the individual level as regards professional development of teaching. This does not stimulate and motivate the utilisation of new technology and new teaching methods. The Commission therefore recommends a review of the range of general instruments and incentive schemes for the education area at the individual,

institutional and national level. The instruments must be coherent and pull in the same direction.

- The Commission recommends appropriating funds toward the development of digital proficiency among employees in the higher education sector. The Commission proposes an annual appropriation of NOK 10 million.
- The MOOC Commission recommends having the Ministry-appointed commission tasked with inquiring into skills outside the formal education system also assess skills developed through MOOCs without exams and credits.

6.3 Infrastructure for MOOCs and other digital learning

Chapter 4 described the development and status of technological infrastructure at Norwegian higher education institutions.

The technological changes in the education sector have been extensive. Digital tilstand 2011 shows that, so far, the boards of higher learning institutions have not devoted sufficient strategic focus to this development in order to strengthen their own ability to make rapid, but correct decisions as regards technology.¹¹⁵ At the same time, it is important to be aware that good adaptation is not about individual technologies, but rather a system of technologies that, together, must be adequate in order to support the institution's strategies. This means that one must have a comprehensive overview of infrastructure, its implementation and training in the use of new technology. Necessary support systems should also be included.

Continued accelerated digitisation of education presumes that the authorities have clear priorities for such development, and that the institutions are able to allocate sufficient resources for such purposes. In the opinion of the Commission, there is a need to further develop the infrastructure for web-based education in general, but also develop specific infrastructure for MOOCs.

6.3.1 Developing infrastructure for web-based education in general

Good-quality MOOCs e.g. presume technological infrastructure that enables teaching via the Internet on a massive scale. eCampus is a five-year technological infrastructure programme that will provide universities and university colleges with joint, modern solutions and tools. The project will enable the institutions to work with a long-term, strategic perspective to develop physical, educational and social learning environments.

By using digital collaboration tools and learning resources, multiple institutions can join together to offer education with a quality that can be difficult for a single institution to provide alone. In order for Norwegian institutions to be better equipped to digitise education, the Commission believes that the efforts to strengthen the technological infrastructure should continue. The Commission therefore proposes to increase the annual national appropriations for technological infrastructure by NOK 10 million.

6.3.2 The need for special MOOC infrastructure

In recent years, universities have implemented web-based support systems for education, Learning Management System (LMS) (cf. Chapter 4). These systems take a point of departure in traditional campus teaching and are organised around virtual classrooms. This means that the class is made up of students and that documents are made available in the virtual classroom. Other types of resources are normally also integrated, such as the opportunity to create tests, written assignments, quizzes, etc. An LMS is normally also a closed resource, where only students enrolled in a given subject have access. Because the platforms are closed, it is normally not possible to link directly to a resource on the platform from an external source. Nor is it easy to integrate social media in LMS, so that messages in the system, for example, also automatically appear on Facebook.

¹¹⁵ Norway Opening Universities (2012) *Digital tilstand i høyere utdanning 2011*. (Digital status of higher education 2011 - transl. note) Tromsø: Norway Opening Universities.

The commercial MOOCs provided by Coursera and Udacity are more closed solutions in the xMOOC genre, which means courses where there are a large number of students, but little interaction between them. Many of those who have offered cMOOCs, i.e. courses that incorporate a lot of interaction between students, have chosen to use the Canvas platform. The advantage of this platform is that it is very open; it is easy to integrate resources such as blogs (Wordpress), co-writing tools (Etherpad and Google Drive), Twitter, Facebook and video services such as YouTube and Vimeo directly in the system.

A relatively open publishing platform like Canvas can also handle different groups of users. In Canvas it is possible to have a single content set with multiple groups of students with different deadlines for different assignments. Students can interact across the group divisions or work independently if they so desire, and can interact with other students who are not participating in the course. Materials created in social media are also made available through these social media.

By using such open platforms, the participants learn ways of working that can easily be recreated in other contexts, for example in their own work. If the objective is to develop new, innovative teaching methods, such as social interaction and establishing personal learning networks, it is a significant advantage to use such open publishing platforms. This is particularly true for students who are experienced users of social media. Messages sent in Canvas can then “pop up” on the student’s Facebook timeline and answers to questions can be delivered directly in Facebook. This will make the assignments they complete known in the participants’ own social networks, thus creating networking effects and possibilities of self-perpetuating growth. If Norway wants to focus on developing more expertise in the development of MOOCs and a larger scope of MOOC provisions, it is therefore important to make appropriate platforms available for this work. This will require effort in testing and developing technologies. The Commission proposes an annual allocation of funds for this totalling NOK 10 million.

6.3.3 A joint MOOC portal?

Developing joint portals can be advantageous for both providers and users of MOOCs. France, for example, has started developing a joint, national web portal for universities offering web-based education or MOOCs; France Université Numérique (FUN). This portal will, as previously mentioned, use the edX platform (cf. Chapter 5.2.7). In Norway, one opportunity has so far been established for Norwegian education institutions that want to test the concept by using the Canvas open source platform. This opportunity is provided by BIBSYS, a national joint service and systems provider for universities and university colleges. BIBSYS is also in the process of establishing the open source-version of edX for testing among Norwegian higher education institutions, and will be available in early 2014. If institutions plan to offer courses as MOOCs, or use the technology to deliver courses to its own or other institutions’ students, the Commission believes it would be relevant to consider joint platforms. With the exception of the largest universities, few have the resources to operate their own solutions, and even those that do will most likely find it to be inefficient and irrational to operate and maintain such solutions themselves.

Norway has a long tradition of establishing joint solutions for complex IT systems (FS (Common Student System), SO (Norwegian Universities and Colleges Admission Service), Biblioteksystem (library management system - transl. note), etc.). It will most likely be appropriate to establish a joint solution for MOOCs and similar systems as well. For example, a joint portal will be an advantage for smaller institutions. With new technology founded on cloud-based operation and storage, a limited amount of resources will be needed in order to provide Norwegian higher education institutions with platforms similar to the familiar ones used by world-class universities. The cost of such a solution will most likely be far below the price one would have to pay to participate in e.g. edX, or the rights one would be forced to relinquish by participating in the more commercial solutions.

The advantages of being part of the familiar international solutions will be visibility and attention. On the other hand, it is doubtful that the international solutions will be able to satisfy

the need for preserving Norwegian language and culture. This is better achieved with national solutions that can be part of e.g. the European OpenUpEd. By using an open source-version of Canvas or edX, for example, there will also be good opportunities for exchanging courses between these and national platforms. It will then e.g. be possible to reuse one's own or others' courses, presuming the licensing is available. Another opportunity could be to focus on Google and edX' new joint project, mooc.org, which will open in 2014. This will most likely be freely available for both institutions and individual lecturers who want to offer courses, without obligating the course participants to pay. But someone will have to pay, and in this model it will most likely be the individual person who is logged in, and who is thus sharing knowledge about his/her own behaviour with Google, which in turn will profit from advertising.

The Commission also believes that Norway should consider whether it would be appropriate to have a joint, national portal, or whether other alternatives would be more relevant. This is a decision that must be made on a national, strategic level. The Commission proposes exploring this in more detail.

6.3.4 the Commission's recommendations

- The Commission believes there is a need for continuing and increasing the national appropriations for technological infrastructure. The Commission proposes increasing the appropriations toward development of infrastructure for web-based education in general by NOK 10 million annually, as well as an annual NOK 10 million toward developing new infrastructure for MOOCs in particular.
- The Commission recommends more in-depth study of whether it is appropriate to have a single, national MOOC portal or whether alternative solutions are better.

6.4 Skills needed in business and the labour market

In this chapter, the Commission will consider the role MOOCs can potentially play in order to satisfy the need for new skills in business and working life. The Commission has collected feedback from the private sector, primarily from NHO and Abelia. The Commission generally believes that working life will benefit greatly from the opportunities represented by MOOCs and similar provisions. In its further efforts leading up to the final commission report in the summer of 2014, the Commission will therefore solicit feedback from a broader selection of private sector players. In this chapter, the Commission will primarily point out issues that require further scrutiny, and the Commission will also, to a limited extent, provide specific recommendations under this topic in the report.

6.4.1 Skills needed in working life

The social mandate of higher education institutions is to educate candidates that society needs, and conduct research that benefits society over the short and long term. This means that the education and research sector must answer the needs of business and working life as regards knowledge and skills. Norway is a high-cost country and global competition means that business and working life must become increasingly knowledge-intensive and undergo constant development and adaptation. This entails that employees will, to a greater extent, fluctuate between education and work throughout their lives.

There is a considerable need for skills development in working life, both in the public and private sectors. There is a need for more employees in the school, kindergarten, health and care sectors who have completed basic educational or health and care programmes, respectively. At the same time, there is a need for continuing and further education of many current employees, for example teachers. In private commerce and industry, there is also a need for basic education for certain groups, but here the need for continuous updates and skills development for employees is more clear-cut than in the public sector.

Commerce and industry needs ever more specialised knowledge, and there is therefore a need for access to cutting-edge expertise and bespoke solutions in areas where one has special advantages. This may be knowledge linked to special disciplines, often interdisciplinary

knowledge areas, which challenges the discipline-oriented education institutions. It will be important to connect experience-based and academic skills through interaction between players. This could elevate the subject and make it more relevant and useful for the companies. Continuing and further education must be organised in a flexible fashion, and providers must be able to quickly offer studies in areas that may strengthen companies' competitive situation. For many companies, it is important that employees can work while also participating in continuing and further education. Most major private and public businesses have e-learning platforms where they offer internal training for employees. A number of major corporations offer extensive web-based education programmes adapted to their own activities.

The traditional way of studying, by travelling to a higher education institution, living and being away from your workplace for weeks at a time, is not conducive to the need for presence expressed by both companies and public employers. This thus represents a limitation as regards the number of people participating in continuing and further education.

The Nordic Institute for Studies in Innovation, Research and Education (NIFU) has carried out a mapping of continuing education and training in Norwegian small and medium-sized businesses (SMBs).¹¹⁶ The report states that most businesses in Norway experience higher qualification requirements in a number of areas, particularly within the use of technology and professional updates in the companies' areas of expertise. A large number of companies state that they have difficulties recruiting personnel with correct or sufficiently extensive expertise, especially in areas where the industry structure is specialised and industry-focused. The report also shows that SMBs invest less in continuing and further education than major companies. Knowledge-intensive companies with high education levels invest the most in continuing and further education. Outside university cities, the majority of businesses' expenses on continuing and further education is on formal continuing professional development. Private course providers and industry-focused courses are the most important suppliers to SMBs' skills development. Of the universities and university colleges, university colleges outside major cities are the most important providers of continuing and further education.

6.4.2 The Commission's assessments

It is the Commission's understanding that there is a considerable need for skills development in business and the labour market. Continuous knowledge development is resource-intensive for businesses. MOOCs and other forms of web-based education can therefore be highly significant in making education and skills development more accessible and individually tailored to the workplace. This also applies to the public sector. For example, continuing professional development of teachers can be carried out on a large scale, be more individually tailored, and more cost-effective by using flexible provisions.

The Commission believes that society's needs and technology development put pressure on the higher education institutions to strengthen flexible study programmes that are adapted to learners other than traditional campus students. There will thus be a need for strategies as to how MOOCs and other forms of flexible education can be more tightly integrated throughout the higher learning institutions' activities.

In the opinion of the Commission, formal expertise in the form of degree programmes will remain important as a basis and for and as a door-opener into working life. MOOCs can play a role as part of such degree programmes, cf. Chapter 6.5. The Commission sees a development where the labour market is becoming increasingly skills-intensive, and where the percentage of employees with formal higher education is rising. This, in turn, will result in the labour market increasingly requesting new types of skills, preferably in addition to formal education, specifically adapted to the individual industry or business. MOOCs can play an important role

¹¹⁶ NIFU (2013) *Bedriftskultur for læring. En studie av videreutdanning og opplæring i norske små og mellomstore bedrifter* (Corporate culture for learning. A study of continuing education and training in Norwegian small and medium-sized businesses - transl. note), NIFU report 27/2013.

here as well. In the opinion of the Commission, MOOCs have the potential to give commerce and industry access to cutting-edge expertise on a global scale.

Stronger cooperation and increased relevance

The Commission believes there is a potential for strengthening the coherence between what the education institutions offer and what is in demand from commerce and industry. The education institutions are good at delivering initial education. Many small and medium-sized businesses operate in specialised, international markets and require specialised, interdisciplinary expertise. There is already a need and market for bespoke education. The Commission believes that the education institutions' range of studies are hardly adapted to the SMB's need for specialised offers. This was also pointed out by NHO in its input to the Commission. Flexible education in general and MOOCs in particular can contribute toward ensuring that the right expertise is available more quickly. It is important that this is organised in a sound manner. The current education institutions and MOOCs are not in opposition to each other, but can rather effectively complement each other. The future will consist of a diversity of combinations between MOOCs and blended learning.

Broader supply side – increased competition in the education market

The international emergence of MOOCs exposes the education sector to competition as regards providing businesses with what they need. NHO points out that commerce and industry are concerned with maintaining a high level of quality and relevance in education programmes, and are less concerned with who is providing them. Development is under way on a supply side that is global and with contributions from the most renowned education institutions in the world. If Norwegian education institutions cannot satisfy this need, someone else will. The education sector's proximity to Norwegian business and working life provides a good starting point for strengthening this part of the institutions' activities. In the opinion of the Commission, flexible education and MOOCs can be tools the institutions can use to occupy this space. The alternatives will be the emergence of a privatised market in addition to the public higher education, which is more niche-oriented and more specialised toward the needs of commerce and industry.

One important question in this context is initial education versus specialised continuing and further education. One scenario is that higher education institutions will handle initial education, while the more specialised continuing and further education services will largely be left to other players. At the same time, in order to offer good, relevant initial education, contact with working life will be crucial. In the same way, good, specialised services may depend on a good basic education foundation. The Commission believes that a higher education sector that is able to satisfy needs linked to e.g. continuing and further education, an interdisciplinary approach and bespoke education, will also be important in order ensure relevance in initial education. The Commission therefore would like to see a development where the education institutions seize these opportunities.

Norwegian higher education institutions as facilitators for commerce and industry

Norway can never be self-sufficient as regards expertise. Even though the Norwegian institutions are able to satisfy a considerable amount of the skills in demand, it will also be relevant for business and the labour market to acquire knowledge externally. Outstanding expertise can flow nearly free of charge between countries and continents, and represents a significant potential for the part of Norwegian commerce and industry that depends on being at the forefront as regards expertise. But it may be difficult to identify and assess the quality of which MOOCs may be appropriate.

The Commission believes there is a need for a facilitator that knows both academia and the needs of business and the labour market, and that can help identify relevant MOOCs and similar provisions. It can be particularly important for small and medium-sized businesses to have a facilitator that knows local and regional businesses, and that that is capable of assembling MOOCs and other knowledge in a bespoke fashion; preferably in various combinations of web-based and face-to-face learning. There will be a need for quality-assuring the available range of

MOOCs, and thereby help provide businesses with a qualified expertise plan. For businesses, the formal accreditation of learners is not necessarily important in itself, but it is important as a way of quality-assurance. For employees who follow such courses, it will be very important to have independent accreditation of skills, regardless of the specific business for which they work.

The Commission believes that higher learning institutions may play a key role as facilitators or expertise brokers. The institutions' advantage is proximity to experience and familiarity with business and the labour market in the region. Such a role may also be useful for the education institutions, as increased awareness of the skills demanded by business and the labour market may lead to increased relevance in the academic content of the study programmes.

Strategic opportunities and policy instruments

In the opinion of the Commission, the education sector should therefore attempt to seize the opportunities that exist today and which will only grow in the years to come. The sector should assume the role of profiled continuing and further education player, as well as the role of facilitator between supply and demand in relation to commerce and industry. At the same time, it is important that business and the labour market take an aggressive stance themselves. The Commission believes that business and working life should utilise MOOCs and similar services in employee skills development.

One key question will be how to facilitate, on a strategic and political level, a development where the sector can increase its range of continuing and further education services and more bespoke courses. In the opinion of the Commission, it will be necessary to use public incentives in order to create the desired development and a competitive dynamic within a service area that is regulated by the Norwegian State. MOOCs thus have the potential to become a driving force for more specialisation in the education sector. The higher education sector's focus on relevance for working life must therefore be given an even clearer role than is the case today. Here there is a need for stronger incentives. In the opinion of the Commission, an objective of relevance for the higher education sector should be considered as part of sector financing, cf. Chapter 6.8.

One of the national policy parameters set by the Ministry of Education and Research for the institutions' priorities and objectives, concerns flexible education, including distance learning and eCampus. This reporting provides important knowledge about results, priorities and the development of flexible education, both at the individual institution and on a national level. The Commission also believes that it will be appropriate for the institutions to report on goals, development and results linked to MOOCs under this policy parameter. The Commission believes the Ministry should clarify such expectations in reporting requirements.

Developing MOOCs in key disciplines

In 2012, the Ministry of Education and Research allocated funds to Norway Opening Universities to announce the award of funds for the development of flexible education deliveries linked to eCampus and cooperation, division of labour and concentration (SAK). The Commission believes that national stimulation funds of this type are highly important. In order to develop MOOCs in higher education, the Commission proposes allocating funds to stimulate national collaborative measures for developing MOOCs in study programmes. The 2014 National Budget allocated NOK 10 million for the development of web-based continuing professional development for teachers, including MOOCs. The Commission recommends increasing these funds in order to also include other key disciplines.

6.4.3 The Commission's recommendations

- The Commission recommends that business and working life use MOOCs and similar provisions for employee skills development.
- NOK 10 million has been appropriated for continuing professional development for teachers using MOOCs and similar provisions. The Commission recommends allocating an additional NOK 10 million to develop and acquire experience in the use

of MOOCs and similar provisions in continuing education within other relevant education areas as well.

6.5 Norwegian higher education: accreditation and recognition of MOOCs

The Quality Reform introduced a comprehensive system of quality-assurance in Norwegian higher education. The institutions were given greater academic authority to establish and discontinue study programmes, but also, as part of the reform, an academically independent body for quality-assurance in higher education – the Norwegian Agency for Quality Assurance in Education (NOKUT) – was established. Systems were introduced for accreditation of study programmes and institutions, and requirements were set for all institutions to have their own quality-assurance systems. In this chapter, the Commission will assess the MOOC development in light of the system for quality-assurance in formal Norwegian higher education. MOOCs as an arena for more informal learning or as part of other methods of recognising expertise than in a degree system, are discussed in Chapter 6.2.

6.5.1 Norwegian higher education: quality-assurance, accreditation and recognition

Accreditation

The Quality Reform brought about a new system for accreditation of studies and institutions, and NOKUT was established as an accreditation body. The Act relating to Universities and University Colleges determines the degree levels at which the institutions can offer education.¹¹⁷ Both the Act and associated regulations apply to all higher education institutions – including private institutions.

Depending on the institution category, the different institutions have different authorisation as regards establishing new study programmes themselves. If institutions are not authorised to establish study programmes, they must apply to NOKUT for accreditation. The authorisations that apply for the various institutions are displayed in the figure below. Grey means that the institutions can establish study programmes themselves, and red means that they must apply to NOKUT for accreditation:

Authorisation to establish new study programmes	Universities	University colleges Specialised university institutions Accredited private university colleges	Non-accredited university colleges (private)
Undergraduate programmes			
Master's degree programmes			
Doctorate programmes			

The universities, which are all public, are authorised at all levels. Specialised university institutions and university colleges, both public and private, are authorised to establish study programmes at all levels within the disciplines where they are authorised to award doctorates, i.e. the same authorisations as universities within these disciplines. Public university colleges and private university colleges that have been accredited as university colleges, can establish

¹¹⁷ Available at: <http://www.lovdato.no/all/nl-20050401-015.html> The Act is elaborated in separate regulations that lay down standards for accreditation of institutions (Regulations relating to quality-assurance and quality development in higher education and tertiary vocational education). NOKUT's regulations relating to supervision elaborate on the standards laid down in the Ministry's regulations, including requirements for e.g. scientific production and the size and skills profile of academic environments (Regulations relating to supervision of academic quality in higher education).

new programmes at the undergraduate level. Private university colleges that are not accredited at the institution level can apply to NOKUT for accreditation of study programmes.¹¹⁸

The same system applies to joint degrees. If the relevant degree level is outside the authority of the individual institution, it must also apply for accreditation of joint degrees. Norwegian institutions that cooperate to award joint degrees must together satisfy the criteria for accreditation of study programmes. Norwegian institutions can award joint degrees in cooperation with foreign institutions, in which case the Norwegian institution is responsible for ensuring that the foreign institution's part of the study programme has been accredited or approved in line with national rules in the country in question. The Norwegian part must satisfy the requirements in criteria for the relevant degree level in Norway.¹¹⁹

Recognition and exemption

Exams from universities and university colleges that have been accredited, are recognised with the same number of credits between institutions, given that they satisfy the academic requirements inherent in the subject or topic to be recognised.¹²⁰ This means that a student who has taken a subject at a Norwegian institution, will be credited for this subject as part of a degree at a different Norwegian institution, provided the subject satisfies equivalent academic requirements.

It is also possible that subjects taken at foreign institutions may qualify for exemption in a Norwegian degree. The institutions themselves must consider whether the subjects in question provide a basis for such exemption. This is not something for which a student is entitled to exemption, an academic assessment must be made in each instance.¹²¹

Quality-assurance system

Norwegian higher education institutions are responsible for ensuring the quality of their own study programmes.¹²² In order to safeguard this responsibility, the institutions are obliged to have internal quality-assurance systems. The quality-assurance system is a tool for the institutions to acquire necessary knowledge in order to assess the quality of their own study programmes. The systems aim to ensure continuous improvement, identify deficient quality and document quality efforts. NOKUT is responsible for evaluating and approving the institutions' quality-assurance systems.

The qualifications framework for higher education

The Bologna Process established a pan-European qualifications framework for higher education (2005), with learning outcome descriptions for the three main levels of higher education – bachelor, master and Ph.D. The Norwegian qualifications framework for higher education, adjusted in line with the adopted general European framework, was laid down in March 2009.¹²³

¹¹⁸ NOKUT (2013) *Institusjonskategoriar* (institution categories - transl. Note). Available at: <http://www.nokut.no/no/Fakta-og-statistikk/Det-norske-utdanningssystemet/Institusjonskategoriar/> (Accessed: 11 December 2013).

¹¹⁹ NOKUT (2013) *Søk om akkreditering av nye studietilbud og institusjonskategori* (apply for accreditation of new study programmes and institution categories - transl. note). Available at: <http://www.nokut.no/no/Universitet-og-hoyskole/Kvalitetssikring-og-tilsyn/Sok-om-akkreditering-av-nye-studietilbud-og-institusjonskategori/> (Accessed: 11 December 2013).

¹²⁰ The provision concerning recognition and academic approval in Section 3-5 (1) of the Act relating to Universities and University Colleges.

¹²¹ Section 3-5 (2) of the Act relating to Universities and University Colleges.

¹²² The Ministry of Education and Research has laid down separate regulations on quality-assurance and quality development in higher education and tertiary vocational education: <http://www.lovdata.no/cgi-wifit/ldles?doc=/sf/sf/sf-20100201-0096.html>

¹²³ Since then, the Ministry of Education and Research has also laid down a national qualifications framework for all levels of Norwegian education – the National Qualifications Framework for lifelong learning, which is in line with the EU's Qualifications Framework for lifelong learning (EQF). Ministry of Education and Research (2011) National Qualifications Framework for lifelong learning (NKR). Available at:

The qualifications are described through learning outcomes, not input factors. The level descriptions describe the knowledge, skills and competence that all candidates who have completed education at the relevant level must have.

The qualifications framework and relationship with lifelong learning/prior learning and work experience

Documentation, assessment and appraisal of prior learning and work experience is a tool used to facilitate lifelong learning. The right to an Accreditation of Prior Experiential Learning is laid down in the Education Act, the Tertiary Vocational Education Act and the Act relating to Universities and University Colleges. Prior learning and work experience must be assessed in relation to applicable curriculums for primary and lower secondary school, upper secondary education, individual education plans for tertiary vocational education and national curriculums and syllabi for higher education. The objective of assessing prior learning and work experience is for adults to be able to document and appraise their expertise, as a basis for further training or work. Prior learning and work experience must have legitimacy both in the education system and working life. Individuals' prior learning and work experience in subjects cannot be placed directly into the qualifications framework, but Accreditation of Prior Experiential Learning will indirectly be able to provide learners with a shorter course of study leading up to an approved diploma.¹²⁴

6.5.2 The Commission's assessments

Many MOOCs are already offered with exams and credits. It is the opinion of the Commission that the scope of this type of courses will grow and make up an important part of the overall MOOC provisions in the years to come. The Commission believes that this type of MOOCs from familiar providers will hardly amount to a challenge to the current Norwegian degree system. On the contrary, they can be part of the degree system and supplement other subjects and courses within this system.

MOOCs at Norwegian institutions

If Norwegian institutions want to offer credit-earning MOOCs, the normal rules for higher education will apply. The accreditation system does not distinguish between types of courses. Universities decide for themselves which subjects and courses the institution will offer, regardless of level, while university colleges and specialised university institutions have more limited opportunities for doing this themselves and will be forced to apply to NOKUT for accreditation at certain levels.

The same will apply as regards quality-assurance: The normal quality-assurance rules must apply to institutions that offer MOOCs with exams and award credits. When an institution offers such MOOCs, these study programmes must thus also be included in the institution's quality-assurance system.

If MOOC students are to take exams and earn credits, these students must have been accepted in the study programme according to applicable enrolment requirements. This applies both to those who take exams in a course and those who take exams as external candidates.¹²⁵ Students who take MOOCs with exams and credits at Norwegian institutions, can receive a normal transcript as documentation.¹²⁶ Such subjects/courses can be included as part of a degree.

<http://www.regjeringen.no/upload/KD/Vedlegg/Internasjonalt/UNESCO/NasjonaltKvalifikasjonsrammeverk200612.pdf> (Accessed: 11 December 2013).

¹²⁴ Ministry of Education and Research (2011) National Qualifications Framework for lifelong learning (NKR). Available at:

<http://www.regjeringen.no/upload/KD/Vedlegg/Internasjonalt/UNESCO/NasjonaltKvalifikasjonsrammeverk200612.pdf> (Accessed: 11 December 2013).

¹²⁵ Section 3-10 of the Act relating to Universities and University Colleges.

¹²⁶ Section 3-11 of the Act relating to Universities and University Colleges.

A student who has completed MOOCs with exams and credits at an accredited institution in Norway, will be entitled to exemption from equivalent exams at other institutions. This means that MOOCs in this form, taken at an institution, can be part of a degree at other institutions as well. In these instances, it must be presumed that the MOOC service has been quality-assured at the institution where the course was taken, in the same manner as though the student had taken a different type of course at the institution. However, the Commission believes that practice at the institutions as regards administration of the system, has room for improvement. The Commission urges the institutions to increasingly use the latitude inherent in the system, by better facilitating smoother transitions across institutions. The Commission also believes that there is a need for a study as to whether the current practice is appropriate and what can be done to strengthen the institutions' practice within the current rules.

It will be challenging to incorporate MOOCs without credits and exams into a degree in the same way as it will be problematic to approve other types of subjects or courses the student has taken, but without sitting for an exam. Regardless, this will be an academic assessment that must be made at the individual institution. The Commission believes that such assessments must continue to be made by the individual institution exercising its academic judgment.

MOOCs delivered by foreign institutions

MOOCs with exams and credits from foreign institutions must be assessed in the same way as other types of subjects and courses students take at foreign institutions. This means that an academic assessment must be carried out, in the same way as is currently done for other foreign education. This is an academic assessment that must be done by the individual institution.

How students and institutions should relate to quality-assurance of this type of courses may be challenging, however, particularly in the event of a large number. If the number is sufficiently large, especially as regards hitherto unknown players, it is uncertain whether the institutions will have the capacity to carry out the assessment themselves. In the opinion of the Commission, there may be a need for systems or arrangements to support institutions in their work linked to quality assessments, for example national systems for quality-assuring MOOCs.

It will be challenging to grant credits for a MOOC without an exam or credits from a foreign institution toward a degree at a Norwegian institution. In the opinion of the Commission, such a MOOC must be assessed according to the item regarding discretionary assessment. For a student who has taken a MOOC without sitting for an exam, it may be challenging to document that this subject or course is equivalent to the subject or course from which the student is seeking exemption. It will thus be problematic to incorporate it into a degree. This will be a discretionary academic assessment for each individual institution.

The Commission believes that Accreditation of Prior Experiential Learning may be more relevant in the institutions' assessments of MOOCs without exams and credits. It is the case today that one is entitled to have one's prior learning/work experience assessed for the purpose of enrolment and recognition of this type of expertise in degree studies. If the number of students completing MOOCs increases, this may lead to increased demand for this type of assessment. In that case, the Commission is of the opinion that MOOCs will make Accreditations of Prior Experiential Learning even more relevant than they are today. The Commission believes that this will put pressure on and demand increased attention to good practice of Accreditation of Prior Experiential Learning from higher education institutions.

MOOCs without exams and credits can also be viewed as a form of skill acquisition offer that is not necessarily intended to be incorporated into a degree system. This type of MOOCs, as an arena for more informal learning or as part of other methods of recognising qualifications, is discussed in more detail in Chapter 6.2.

Admission to MOOCs as part of degree programmes

One of the most important characteristics of MOOCs is that there are no prerequisite knowledge requirements for participation. Admission to higher education in Norway, however, is strictly regulated in a separate framework, including the Regulations concerning admission to higher education.

The main rule for admission is that applicants must satisfy the Higher Education Entrance Qualification. There are certain exceptions to these rules.

The Commission believes that one of the most important reasons for admission restrictions is the capacity limitation in higher education, which follows from campus-based education. The skills and prerequisites applicants need for higher education is another important reason for admission criteria. Open access is an important asset, both for individuals and for skills development. The Commission believes that open access to MOOCs should also be an asset in Norway. However, this challenges the Regulations concerning admission higher education in Norway. At the same time, broader and more open access will have both fundamental and financial consequences for higher education. The Commission is of the opinion that limited space as an argument is not equally relevant in a MOOC context. As regards MOOCs with exams and credits, however, costs will be incurred in connection with e.g. admissions, examinations and recognition.

The Commission believes that questions concerning open access must be assessed more thoroughly and on the basis of principle. Experience from MOOCs can be valuable contributions in the evaluation. The Commission therefore recommends trial admissions to MOOCs at Norwegian institutions for applicants who do not satisfy traditional requirements for admission to higher education.

6.5.3 The Commission's recommendations

- The Commission believes that MOOCs do not warrant changes to the Norwegian regulations for accreditation and recognition of subjects and courses as part of a degree programme. MOOCs with exams and credits from both Norwegian and foreign institutions can be regular parts of a degree as this system exists today.
- The Commission recommends that the institutions exploit the latitude available in exercising the regulations for recognising subjects and courses as part of a degree, by facilitating better and more efficient practice across Norwegian institutions.
- The Commission recommends a study as to whether the current practice is appropriate and what can be done to strengthen the institutions' use of the latitude in the current regulations for recognising subjects and courses as part of a degree.
- The Commission recommends trials with admission to MOOCs at Norwegian institutions for applicants that do not satisfy the traditional requirements for admission to higher education.

6.6 Student fees and the no-fee principle in higher education

6.6.1 Background

The student fee regulations are the statutory expression of the no-fee principle, which entails that public higher education shall be free, cf. Section 7-1 (1) of the Act relating to Universities and University Colleges. Private higher education institutions can, however, charge student fees under certain conditions. The student fee regulations apply regardless of whether the education is on campus or web-based. Prevailing regulations do not preclude organising abroad parts of the education provided at Norwegian higher education institutions, which lead to Norwegian degrees.

Section 3-1 (3) of the Regulations relating to student fees at universities and university colleges states that public institutions shall not profit financially from cooperation with other enterprises on student-financed study programmes or subjects/courses they, pursuant to these regulations,

cannot offer themselves. Section 3-2 stipulates that public institutions may charge student fees in the following instances:

- a) For subjects/courses that are normally not part of study programmes that lead to a degree or vocational training
- b) For experience-based master's degree studies
- c) From students who fill vacant spots in study programmes or subjects/courses that are financed by contract

Section 3-3 (1) of the Regulations also stipulates that, as regards study programmes or subjects/courses for which institutions cannot charge student fees, the institution also cannot charge students fees beyond actual costs linked to teaching materials. The higher education institutions cannot establish agreements with external players which entail that students must pay for teaching, exam grading, etc.

6.6.2 The Commission's assessments

Participants in an open MOOC will have various ambitions, depending on whether they are regular full-time students, are working and want to develop their competence or are simply academically curious of a new field. Study programmes that have highly heterogeneous student groups with different participation goals, may lead to confusion as regards who can potentially be charged fees by the institutions. The emergence of a number of different variants of MOOCs may, in the opinion of the Commission, increase confusion and the room for interpretation in the current student fee rules. This may lead to the development of divergent practices between institutions, with the effect that student are not treated equally.

If the institutions are to offer open MOOCs and similar courses online where many students produce no credits and are not included among regular students at the institution, the Commission believes that it should be possible to charge fees for certain parts of a student group. The Commission therefore proposes that the Ministry undertake a review of the regulations in order to clarify the institutions' latitude to avoid divergent practices between different institutions.

6.6.3 The Commission's recommendations

- The Commission believes that MOOCs in Norway should, as a point of departure, be free.
- The Commission recommends that the Ministry review the regulations for student fees in order to clarify the institutions' opportunities to charge student fees for parts of a participant group.

6.7 Educational support

In this chapter, the Commission will assess what consequences MOOCs will have for the educational support system in Norway.

6.7.1 Background and current arrangements

The objective of the educational support system is to provide access to education, regardless of geography, age, gender, level of disability and economic and social conditions, cf. Section 1 of the Educational Support Act. The system aims to ensure that society and the private sector have access to skills and that education can take place under satisfactory working conditions, thus ensuring that coursework can be efficient.

Educational support is intended for subsistence during education, cf. Section 5 of the Act. Support may also be awarded for other expenses linked to the education, such as tuition and travel. As regards the award of educational support to individual students, there is a regulatory framework for admission requirements, the right to take exams, academic requirements, limits on how many years for which support may be awarded, application deadlines and age limits.

Framework for the amount and duration of support

Educational support is awarded during the nominal length of study for the individual education programme. As regards combinations of higher education and other education to which the applicant is not entitled pursuant to the Education Act, support can be awarded for up to eight years. Over the course of these eight years, the student can receive support for up to one year, or 60 credits, of delays. The student can receive support for part-time education, with a minimum of 50 per cent student work load. The education must last at least one semester, which is four months in practice. Support will be awarded in proportion to the student work load. The support is disbursed as loans, and students who do not live with their parents can have up to 40 per cent of their basic support converted into an educational grant, given that they pass their exams. The grant part of the support amount depends on academic progression, which is measured for each semester. If the student takes fewer credits than the norm for a semester, a smaller share of the loan will be converted into grants.

Education programmes that are eligible for support

Support can be awarded for higher education both in Norway and abroad. The main rule for approving support for Norwegian education is that it is included in the Norwegian education system, and has been approved pursuant to an education act. The fact that the education programme must be approved pursuant to an education act, also entails that the education programme has admission requirements. Higher Education Entrance Qualification is generally required in order to be admitted to higher education in Norway. Ordinary admission according to these rules is a precondition for the right to educational support.

The main rule for being entitled to support for foreign degrees is that NOKUT can recognise it as equal to Norwegian higher education at the bachelor's or master's level. Alternatively, it can also correspond to Norwegian Ph.D. education. Part-time education is eligible for support in Norway, but not abroad.

Citizenship

As a main rule, the student must be a Norwegian citizen in order to be entitled to Norwegian educational support. Citizens from EU/EEA countries and their family members are on par with Norwegian citizens if they have an employment connection to Norway, or have a permanent residence permit.

Foreign citizens from countries outside the EU/EEA may receive support if they have a special connection to Norway due to their employment, education, spouse, family or other circumstances, or have entered the country for political or humanitarian reasons. This group's support entitlement does not cover entire study programmes abroad.

Support for education abroad

As regards education abroad that is eligible for support, this support will be disbursed according to the normal rules for subsistence, travel and tuition. The amount for subsistence is the same as in Norway. Larger amounts are awarded for travel and tuition than for education in Norway, and a certain percentage of tuition support is provided as grants.

More details on the rules for support for web-based education

Support may be awarded for web-based education offered by Norwegian higher education institutions, but not foreign web-based education. The Norwegian web-based education must correspond to higher education at public education institutions and must conclude with an exam. As regards web-based education in Norway, support is awarded according to normal rules, so the education must, as a main rule, be included in the Norwegian education system. Support may be provided for travel and tuition, in addition to subsistence.

Support for students taking foreign web-based courses has not been a priority. There are two reasons for this; on one hand, the objective of supporting study abroad is that the students, in addition to the formal learning, take part in a different society, and learn culture and language from the inside, which will enrich Norwegian society when the education is completed. Web-

based education abroad is not considered study abroad in this context. Foreign web-based education deliveries also feature significant variations, which means it is not always easy to have confidence in the quality of this type of education.

The Ministry is working on proposals to open up for support for web-based education offered by higher education institutions in the EU/EEA. This is a consequence of ESA (EFTA Surveillance Authority) pointing out that the distinction between Norwegian and foreign online schools violates the Services Directive (Directive 2006/123), as well as the general prohibition against discrimination in Article 4 of the EEA Agreement, as regards the entitlement to support for tuition. ESA's opinion is that Norway is obliged to treat both providers and recipients of web-based education equally, regardless of the geographic location of the higher education institution. This equal treatment includes the students' right to support for tuition charged by the higher education institution. The obligation for equal treatment applies to higher education institutions established in the EU/EEA. In its work, the Ministry presumes that the normal rules for education approval shall apply, which e.g. means that the web-based education must fundamentally be structured as traditional higher education.

6.7.2 The Commission's assessments

MOOCs and similar deliveries vary considerably as regards e.g. who is providing the education, how the education is structured, the cost of the education and the final outcome of the education. Today, the vast majority of MOOCs on an international scale are open and without admission requirements. MOOCs developed in Norway and structured in line with current regulations for higher education will, in the opinion of the Commission, not pose any challenges as regards the current educational support system. Support is already provided today for web-based courses with a minimum of 30 credits, given that the student work load is 50 per cent or more.

However, the Commission sees that a number of different MOOC variants will affect the students' ability to receive support through the current educational support system. MOOCs and similar provisions are characterised by the fact that there are no admission requirements for the courses, as is the case in higher education. Furthermore, the foreign study programmes often yield less than 30 credits. It is also unclear for many of the study programmes how to acquire sound knowledge concerning the education quality, how formal assessments are made and how many credits a course will yield.

There are already a number of challenges linked to the educational support system for web-based courses. MOOCs contribute toward rapid upscaling of volume and globalisation of web-based provisions, and it is possible that large groups of students may utilise such education deliveries. This means that the authorities should identify new solutions to challenges that quickly satisfy the Norwegian educational support system's needs in line with the growth in MOOCs and MOOC participants.

In order for additional learners in MOOCs to be included in the Norwegian educational support system, the current educational support system will have to be expanded. The Commission cannot provide a detailed proposal for the content of such an adjustment in this report. The Commission will therefore propose a review of the educational support system with the aim of stimulating more students to enrol in MOOCs and other forms of web-based provisions, or provisions that combine web-based and campus education.

In general, the Commission wants to point out that the Norwegian educational support model is excessively based on the idea that there is a period in life when one pursues education and a period when one is employed. The Commission believes that this model may turn out to be poorly adapted to the new trends in higher education, where one alternates between education and work throughout large parts of one's life. The Commission is aware that this issue touches on the distinction between financing initial education and continuing and further education.

Assessments of the educational support system must take into consideration the fact that there are different groups of students. It is relevant to assess the system in relation to both Norwegian and foreign MOOC participants, as well as both Norwegian and international MOOC provisions. In this connection, the Commission believes that there are four groups of participants against which the educational support system must be assessed:

Norwegian participants in Norwegian MOOCs	Foreign participants in Norwegian MOOCs
Norwegian participants in foreign MOOCs	Foreign participants in foreign MOOCs

Citizens from EU/EEA countries and their family members are on equal footing with Norwegian citizens if they have an employment connection to Norway, or have a permanent residence permit. Foreign citizens from countries outside the EU/EEA may also receive support if they have a special connection to Norway, cf. 6.7.1 above. Assessments made for Norwegian participants will thus also have consequences for foreign participants. This means that assessments of potential changes to the educational support system for Norwegian participants must also consider the consequences of these rule changes for foreign participants.

Flexibility as regards student work load and progression

The Commission recognises that the full-time student is the objective of Norwegian education policy. Nevertheless, the Commission believes that the limit of 50% student work load in order to satisfy the criteria for educational support is hardly adapted to the new web-based, flexible provisions within higher education. The preliminary data available on how students use MOOCs and similar provisions indicate that many choose to take courses that result in less than 50% student work load. The Commission believes that it can be very beneficial to society, business and working life that people are enrolled in higher education with less than a 50% student work load. A system where students can distribute their student work load over a greater number of years will be important for those who, for different reasons, cannot study full-time, e.g. due to work, family, illness or other circumstances.

Another key element of MOOCs and similar provisions is that they increasingly relinquish the student from the time aspect. The Commission has noted that the new provisions within higher education challenge the principles of the educational support system as regards progression and completion within a given timeframe. The Commission also believes that the support system should be more focused on results in the form of credits earned, and less focused on the time spent earning these credits.

Support for provisions without admission requirements

The Commission also believes that arrangements should be considered where students can receive educational support even though the course of study has no admission requirements. Here, attention should be devoted to the fact that the student is completing an education that yields a formal diploma. The Commission has noted that one of the arguments against equal treatment of Norwegian and foreign web-based education is concern linked to the quality of certain foreign provisions. The Commission believes that educational support should not be provided for all forms of foreign web-based education, and that it is crucial to have good systems in place for quality-assurance of these provisions. The Commission is of the opinion that the Norwegian educational support system should be able to include foreign web-based education that has been quality-assured by foreign players.

Support for web-based education outside Norway

The Commission has noted that ESA has pointed out that the distinction between Norwegian and foreign web-based schools as regards the right to apply for support for tuition, violates the EEA Agreement. The Commission has also noted that the Ministry of Education and Research is working on proposals to open up for support for tuition for web-based education offered by higher education institutions in the EU/EEA. The Commission supports development in the direction of increasingly equal treatment of Norwegian and foreign web-based education. The Commission believes that this should also apply outside the EU/EEA.

6.7.3 The Commission's recommendations

- The Commission proposes to consider whether to provide educational support to students enrolled in MOOCs and similar provisions with flexible student workloads and durations. Similar provisions means other forms of web-based provisions or provisions that combine web-based and campus education.
- The Commission also believes that MOOCs and similar provisions outside Norway and the EU/EEA should be considered as a basis for educational support.
- The Commission believes that assessments of changes to the educational support system must also include consequences linked to foreign students.

6.8 Financing higher education

This chapter describes the current financing system for higher education institutions. This is followed by an assessment of the challenges MOOCs could entail, as well as the possibilities inherent in using the system to promote the development of MOOCs which the Commission believes should take place.

6.8.1 Current financing of higher education institutions

The financing system for higher education institutions is mainly the same for both public and private institutions.¹²⁷ Each institution receives a basic grant as an overall framework. This block grant covers both long-term and strategic funds, and the normative result-based funding for education and research. The board at each institution is responsible for managing and prioritising the overall block grant as best as possible to achieve the goals the Storting has set for the sector.

The majority of the block grant is related to long-term priorities and strategic allocations, and is more or less fixed each year. This is to ensure the institutions have stable framework conditions. This applies to allocations in connection with recruitment positions, maximum number of students, buildings and equipment. The result-based funding in the financing system reflects the quality of results achieved by each institution in education and research.

The education incentives must reward institutions that provide high-quality education and that allow their students to succeed in their course of study. At the same time, the incentives must allow the institutions to more quickly adjust study programmes in line with students' requests and society's need for expertise. The incentives must also stimulate increased international student exchange. The incentives are calculated with an open budget framework. If an institution improves its results, its allocations will increase. There is one indicator for credits earned and one indicator for the number of exchange students. For public institutions, the gains are reduced in line with potential student fees.

The research incentives will stimulate increased research activities and redistribute resources to institutions with research environments that can document good results. The incentives are

¹²⁷ Ministry of Education and Research (2013) *Orientering om forslag til statsbudsjett 2014 for universiteter og høyskoler* (Information on the proposed 2014 National Budget for higher education institutions – transl. note). Available at: http://www.regjeringen.no/upload/KD/Vedlegg/AU/Statsbudsjettet2014_UH_1.pdf (Accessed: 11 December 2013).

calculated through a result-based redistribution (RBO) on the basis of the institutions' achieved results in the following indicators: a) doctoral candidates, candidates from the Norwegian Artistic Research Programme and collaboration on Ph.D. studies, b) allocations from the EU's framework programme for research and defined activities in this connection, c) allocations from the Research Council of Norway and regional research funds and d) scientific publication.

As of 2010, special funds have been allocated each year to support cooperation, division of labour and concentration (SAK) in the higher education sector. The funds are distributed for one year at a time to institutions with academic results that could result in more SAK-cooperation in the sector. There is also research funding through competition-based arenas governed by the Research Council of Norway.

6.8.2 The Commission's assessments

If MOOCs and similar provisions continue developing at the same rate in Norway as we have seen internationally, the Commission believes that several aspects of MOOCs could challenge the current financing of higher education institutions. If Norwegian institutions gradually develop a considerable number of MOOCs with credits, and a large number of Norwegian and international students use such provisions, this could result in increased funding for the institutions. This could quickly grow in scale. Total allocations to higher education in Norway could also become affected if many Norwegian students choose MOOCs abroad, and if this provides the right to educational support, cf. Chapter 7.4. The development of MOOCs could thus increase the need for growth in higher education allocations. These are important issues that must be assessed at a national level, and by a potential new, future commission that will assess financing of higher education institutions.

At the same time, the Commission believes that adjustments can be made in both strategic funding and the result-based component in the financing system. This could help support positive development of MOOC and similar services.

Cooperation between institutions on study programmes

Cooperation within and across institutional borders could be an important contribution towards high-quality MOOCs. The cooperation could cover both development and operation of provisions requiring involvement of academics, technicians and administrators. Collaboration between the institutions already poses challenges for the current financing system. The institution that provides a complete degree, or holds examinations in a course, will in many cases be the institution that receives the credits and thus financial gains and recognition for the work. The fact that institutions collaborate or use each other's academic digital resources does not change this. There must be a clear division of labour and responsibility for courses if financial gains will be shared. The Commission sees that the institutions currently have a significant degree of flexibility and freedom in order to ensure that collaboration is profitable through their own regulations and framework. However, the Commission still considers it to be important that the financing system provides incentives or arrangements that make collaboration on development and provision of MOOCs and similar deliveries profitable, for example through flexible methods of sharing credit production.

Strategic funding for web-based education and incentives for private sector collaboration

The Commission sees that it is still important to have a flexible financing system which provides the institutions with considerable latitude to make their own priorities. If we in Norway want our education institutions to provide web-based education/MOOCs, the financing system should provide possibilities for such efforts. In the current system, each institution is primarily responsible for allocating its own resources for such purposes.

MOOCs are still in an early phase of development. As of now, it is difficult to assess the extent of which the financing system should take development of MOOCs into consideration. However, the Commission sees that Norwegian institutions must clearly increase the adaptation rate as regards digital development in order to become interesting partners in the international MOOC arena, as well as to attract gifted Norwegian and international students.

In addition to the institutions' own priorities, the Commission believes the authorities must earmark strategic funds for a five-year period to stimulate further development of MOOCs and similar provisions. This will be an arrangement equivalent to the award of funds for cooperation, division of labour and concentration (SAK). Such an arrangement must contain funds which promote development, use and sharing of educational technologies and educational resources. This is discussed more extensively in Chapters 6.2, 6.3 and 6.4. Initially, the Commission proposes new allocations totalling NOK 55 million, starting in 2015. These funds should be placed in the financing system in the same manner as the SAK funds, i.e. within strategic allocation.

Furthermore, the Commission believes there is a need for stronger incentives in the financing system to strengthen the institutions' work on relevance in education and collaboration with working life. The Commission discusses the need for such incentives more exhaustively in Chapter 6.4. The Commission believes that web-based provisions in general, and MOOCs in particular, are a well-suited instrument that the institutions can use to strengthen their work on relevance and collaboration with working life.

6.8.3 The Commission's recommendations

- The Commission recommends that the financing system facilitate incentives or systems that support cooperation between institutions as regards the development and range of MOOCs and similar provisions, for example through flexible ways to share the benefits of credit production.
- The Commission recommends introducing an incentive in the financing system for relevance in education. Cooperation between education institutions and players in working life on MOOCs and similar provisions may be an indicator of such relevance.
- The Commission recommends an annual appropriation within the strategic funds in the financing system, to support the development of educational content in and development of technological infrastructure for MOOCs and similar provisions.

7 Financial and administrative consequences

In Norway, MOOCs and other forms of web-based education have only modestly been included in higher education institutions' overall strategies. The few provisions developed or that are under development have largely been based on the initiative of individuals rather than systematic planning at the institutions. The Commission knows that several institutions are now focusing more aggressively on this topic.

Higher education institutions have extensive authority to make their own priorities and choices when it comes to use of resources. It is the opinion of the Commission that the institutions have greater opportunities to develop and test MOOC-related provisions than what has been done so far.

In order for Norwegian institutions to meet the challenges and possibilities accompanying the growth of MOOCs, the Commission considers it important that the Norwegian State facilitates this through incentives and development funding. Various measures are discussed throughout the report. Here is an overview of these measures.

7.1 Recommendations for financing higher education

In Ch. 6.8, the MOOC Commission assessed the current financing of higher education and made the following recommendations:

- The Commission recommends that the financing system facilitate incentives or systems that support cooperation between institutions as regards the development and range of MOOCs and similar provisions, for example through flexible ways to share the benefits of credit production.
- The Commission recommends introducing an incentive in the financing system for relevance in education. Cooperation between education institutions and players in working life on MOOCs and similar provisions may be an indicator of such relevance.
- The Commission recommends an annual appropriation within the strategic funds in the financing system, to support the development of educational content in and development of technological infrastructure for MOOCs and similar provisions (see 7.2 for more information).

7.2 Measures proposed for the 2015 National Budget

The Commission believes the authorities must earmark strategic funds for a five-year period to develop important aspects of MOOCs. This will be an arrangement equivalent to the award of funds for cooperation, division of labour and concentration (SAK). Such an arrangement must contain funds which promote development, use and sharing of educational technologies and educational resources. This is discussed more extensively in Chapters 6.2, 6.3 and 6.4. Initially, the Commission proposes new allocations totalling NOK 55 million, starting in 2015.

With this, the Commission wants to signal a desire for a strategic, long-term effort. The Commission believes the content and arrangement of specific measures should be able to vary somewhat from year to year. The proposals in this report relate to the 2015 budget. The Commission will consider new measures in the final report. Below is an overview of the measures the Commission believes should be prioritised in 2015:

- The Commission recommends establishing an environment for research-based knowledge development and transfer of knowledge related to learning analytics from 2015 with an annual allocation of NOK 15 million. The structure and form must be considered in relation to the current players and range of instruments.

- The Commission recommends allocating funding to advance the digital proficiency of employees in the higher education sector. The Commission proposes an annual allocation of NOK 10 million.
- The Commission believes there is a need to continue and increase the national allocations for technological infrastructure. The Commission proposes generally increasing the allocations for development of infrastructure for web-based education by NOK 10 million annually, as well as NOK 10 million annually to develop new infrastructure for MOOCs in particular.
- NOK 10 million has been allocated for continuing professional development of teachers using MOOCs and similar provisions. The Commission recommends earmarking another NOK 10 million to develop and gain experience in using MOOCs and similar provisions in further education within other relevant education areas as well.