



# The Norwegian MOOC

*Objectives and development of massive open  
online courses in Norway*

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and Culture

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# Abstract

Over the last few years, many higher education institutions all over the world have created massive open online courses (MOOCs). This development has not been much discussed in the innovation literature, and it is unclear how MOOC should be understood as an innovation. Also, MOOCs are often discussed in the context of the competitive higher education sector of the United States, which is where the MOOC format gained prominence. However, research indicates that there may be different objectives for MOOCs in Europe, where there is more public funding of education. This thesis applies theoretical concepts from innovation studies to understand how Norwegian MOOCs are perceived as innovative and to find which factors that drive and limit these courses as public innovations.

In discussing how MOOCs are innovative I applied a typology to discuss to what extent Norwegian MOOCs are seen as product, process, position and paradigm innovation. I argue that Norwegian MOOCs are primarily seen as product innovations and position innovations, and to some extent as beginning paradigm innovation. They are not seen as process innovation to any large extent.

I apply factors that have been found to be important to explain public innovation as a categorical framework to discuss drivers and limitations to MOOCs in Norway. I find that Norwegian MOOCs are predominantly bottom-up initiatives driven by public entrepreneurs and their access to support. The most significant limiting factors are found in the incentive structures and regulations of Norwegian higher education: MOOCs don't fit with existing regulations and incentives and this causes several problems for their development and maintenance.

The thesis relies on extensive qualitative data material. 12 informants related to seven MOOC projects from four Norwegian higher education institutions were interviewed. The data material also contained news articles, project descriptions and applications for funding related to the same seven courses. The interviews and documents were analysed according to principles from thematic analysis.



# Preface

I would like to thank my supervisors Arne Fevolden and Cathrine Tømte for your encouragement, valuable advice and feedback. Thank you for helping me make sense of a topic as it kept moving under my feet.

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# 1 INTRODUCTION

While the internet and information- and communication technologies (ICT) have been around for a long while, their impact on higher education has been far more moderate than the effects we have seen in other sectors (Bates, 2015). However, the last years have seen the development of several developments in education where use of information and communication technology (ICT) may have a profound impact (Fevolden & Tømte, 2015). The technological elements of this development are not necessarily new: rather, the development is happening through combining existing technologies and methods in new ways. One of the elements that have emerged out of universities over the last couple of years is the *massive online open course* (hereafter referred to as MOOC) - free online courses that are open to all. Over the last few years, Norwegian universities have started to offer such courses, and this thesis seeks to describe how and why this has happened.

With this study, I hope to contribute to the conversation around MOOCs and digital learning by applying concepts from innovation studies to the MOOC phenomenon. The recent development of MOOCs has mostly been researched in the disciplines of education and computer science, but more interdisciplinary research on the phenomenon can improve our understanding and practice of digital and online learning (Veletsianos & Shepherdson, 2015). MOOCs have received relatively little attention from innovation studies, despite much discussion among those who follow the higher education sector about whether MOOCs are “disruptive innovation”, what they may mean for the sector and whether they bring anything new or valuable.

Further, I will discuss the driving and limiting factors to the development of Norwegian MOOCs as public innovations. MOOCs are often discussed in the context of the competitive higher education sector of the United States, which was where they gained prominence. However, research indicates that MOOCs are developing differently in Europe and that this might be attributed to contextual factors such as more public funding of education. As most Norwegian MOOCs have been created within the tuition-free public Norwegian higher

education system, this provides a unique opportunity to apply a different innovative perspective to MOOCs than a classical free market understanding.

## 1.1 What are MOOCs?

MOOC is a term that can be used to describe a very wide array of online courses. It is a relatively poorly defined term and in the literature it is debated what actually constitutes a MOOC (EADTU, 2015, NOU 2014:5). The acronym MOOC refers to courses that are *massive, open* and *online*, and the brunt of the debate is about how we should understand each of these words (Hollands & Tirthali, 2014). Behind these common traits, MOOCs may be rather different. The design models are still evolving and will probably continue to do so (Bates, 2015). The courses have different scopes, vary a lot in their learning resources, various assessment techniques are used, they come from institutions both famous and marginal, and the list goes on. In short, there is a plurality in both backgrounds and implementation.

Because of these differences, detailed definitions of MOOC may miss courses which are relevant to discuss as part of a common development, whereas there is also a danger that the term “MOOC” is used to describe any kind of innovative or online course (Bates, 2015). For this thesis I will adopt the broad understanding of MOOCs that was used by the commission which issued the Official Norwegian Report on MOOCs: I will discuss MOOC under a wide and simple definition as a collection of open, online courses from higher education institutions (NOU 2014:5). This definition maintains a distinction for courses that are scalable and open, but includes courses with different degrees of this scale and openness.

MOOCs are delivered through online learning platforms and often make use of interactive formats, mixing text, sound, quizzes and videos (NOU 2014:5). They often run over a set period ranging from a few weeks to a few months. Some courses are given only once, while others run a couple of times a year. The testing or grading in a course is usually done through automated quizzes and/or peer grading, where a student has their contribution graded by several of their fellow students and in turn has to contribute to grading yet other students' contributions.

The following image is a screenshot from the user interface of a demonstration version of a MOOC. Readers who are unfamiliar with the MOOC format may find more screenshots and a shortened URL for the demonstration course in Appendix 1.

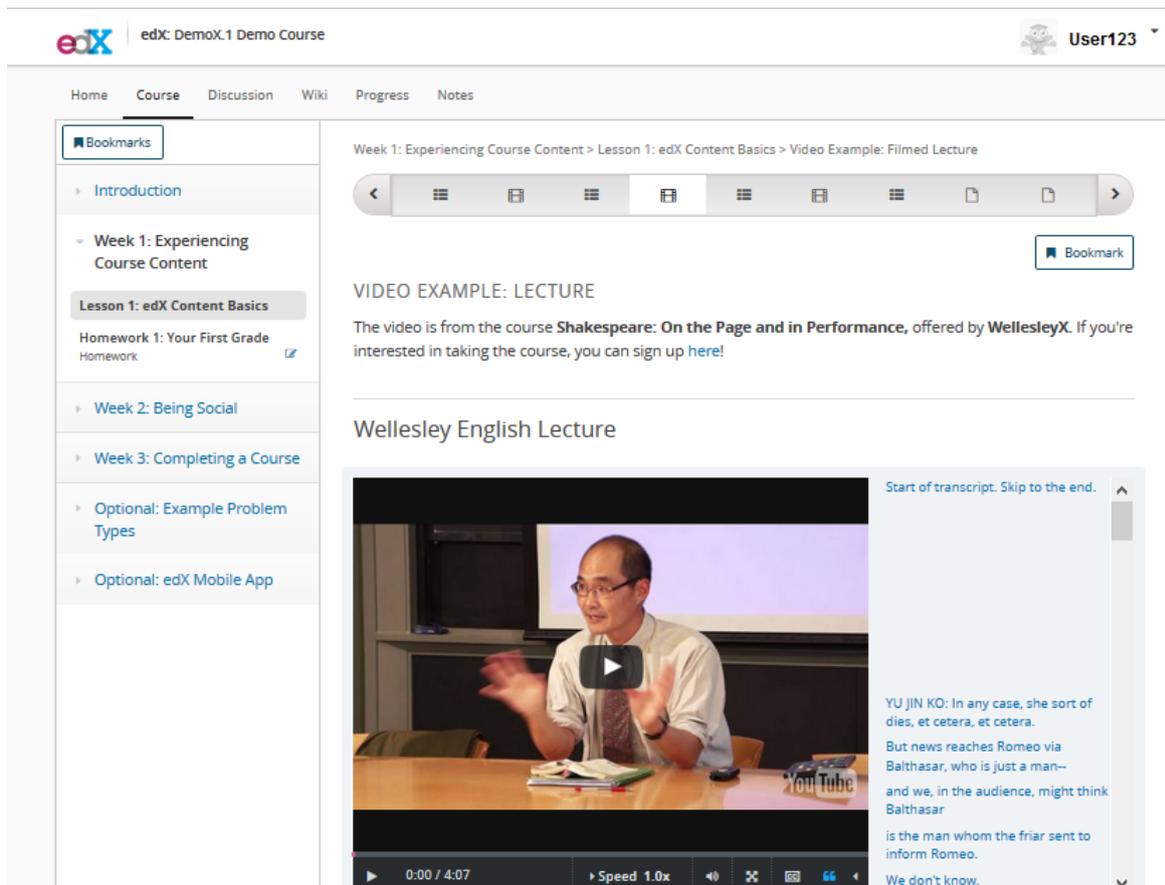


Figure 1: Screenshot from the user interface in a demonstration version of a MOOC.

Online education is not a new phenomenon, but as mentioned, the technology behind MOOCs are being used in novel ways. Computers, the internet, digital animation, video equipment and editing software have become sufficiently cheap, powerful and user friendly that they are now accessible to non-experts. This makes it significantly easier to produce high quality interactive learning experiences. The development of user friendly publishing platforms enabled the creation of courses without possessing programming skills, and this may have served as the instigating factor that allowed MOOCs to be developed.

Massive open online courses should not be seen as an isolated phenomenon (NOU 2014:5). Rather, these courses are part of a wider trend of using information- and communication technology to change learning environments. The reason I will write about MOOCs specifically is that they offer an interesting opportunity in time to discuss digitization in higher education. The fact that MOOCs were free and open sparked great debate about the future of higher education, bringing discussions of online learning onto the public agenda. “MOOC” is not an objectively definable or categorically different kind of course than other online courses, but rather a contemporary term that points to a group of online courses that were released from 2008, which automated aspects of their content delivery and feedback. This in turn made it possible to give a course to unprecedented numbers of students.

## 1.2 The development of MOOCs

The first MOOC is held to be a course created by three Canadian professors at the University of Manitoba in 2008 (Bates, 2015, NOU 2014:5). This course was open to all, free of charge and featured automated elements which made it able to scale regardless of the number of participants. The course attracted some 2300 students, a size no single course had ever had at this point. Later, a popular categorisation of MOOCs holds that MOOCs branched off in different pedagogical directions. They can be placed on a scale between connectivist MOOCs (cMOOCs) or xMOOCs. The difference between the two has to do with the pedagogical foundation of the course (NOU 2014:5).

cMOOCs do not emulate traditional classroom courses but rather conceive of the course as a community of learners the explore issues together. Such MOOCs are based on connectivity theory, a social constructionist perspective where learning is seen as something which happens through communication and sharing (Bates, 2015). Participants are expected to create, share and build on each other’s contributions (Hollands & Tirthali, 2014). There is not necessarily any pre-set curriculum or formal teacher-student relationship. Rather, the dynamics between students have an important role to play, with everyone being both teacher and student simultaneously and communicating by using social media (Bates, 2015). The first massive open online course from 2008 is considered to have been such a cMOOC (NOU 2014:5).

xMOOCs, on the other hand, are more like a digital version of campus teaching: The professor and course manager holds the knowledge, which is to be distributed to and consumed by students (NOU 2014:5). The stream of knowledge flows from lecturer to students. The lecture format is central to conveying knowledge, and students perform digital versions of tests and hand in assignments. Their work is often graded, either by an algorithm in simple quizzes or by other students. xMOOCs are primarily designed to deliver education at scale, and they typically involve structured and sequenced direct transmission of knowledge (Hollands & Tirthali, 2014).

The attention around MOOC in the last few years has mainly been about xMOOCs, and this kind of course now dominates among MOOC offerings (Bates, 2015, NOU 2014:5). American and European actors were the first to offer MOOCs, but the rest of the world has since followed suit (NOU 2014:5). In the fall of 2011, Stanford released three MOOCs that attracted attention. Stanford professors Sebastian Thrun and Peter Norvig created a MOOC version of their course “Introduction to artificial intelligence”. The course got a staggering 160.000 participants ( - and interestingly, none of the top performing students were already attending Stanford). Thrun later went on to found the MOOC platform Udacity. Andrew Ng, who was behind one of the other three Stanford MOOCs, launched the MOOC platform Coursera.

Several other big American universities started paying attention to MOOCs, and by 2011 Massachusetts Institute of Technology (MIT) and Harvard University teamed up to develop a common platform and MOOC development initiative called edX (Bates, 2015). The initiative has been joined by several other large universities. While Coursera and Udacity were for-profit initiatives, edX is a strategic non-profit initiative to develop possibilities in massive online open courses. Many of the MOOCs on international platforms such as edX have been financed through a strategic initiative from big universities (NOU 2014:5). For instance, Harvard has pledged around 30 million U.S. dollars to these development efforts and created a specialized unit, HarvardX, that supports faculty in the innovative use of technology. Several other universities have invested large sums of money on MOOC, presumably in the hope that these investments will pay off by strengthening the institution’s market position.

The first British platform, FutureLearn, was launched in December 2012. One of the largest shareholders is the Open University, which has a long history of correspondence courses and

online learning. The strategy of FutureLearn is to build on the experience that the Open University has gained after many years in the field (NOU 2014:5).

While only four higher education institutions in the U.S. had teamed up with a MOOC platform as of April 2012, the number had doubled many times by the end of the same year (NOU 2014:5). Today, dozens of institutions all over the world have created massive online open courses. In the first quarter of 2014, the number of global MOOCs grew by 60%, from 1369 courses in January to 2230 courses in April. The sudden rise of MOOCs as a new mode of delivering courses to massive audiences drew a lot of media attention, and MOOCs were discussed in several leading papers and became somewhat of a buzzword, epitomized by The New York Times's classification of 2012 as "Year of the MOOC".

### 1.3 MOOCs in Norway

Norway did not have any MOOCs until 2013, when a professor at the Norwegian University of Science and Technology (NTNU) created a MOOC version of their course "Technology and societal change". This course was offered through Canvas, a learning platform that had been developed independently of other MOOC platforms. In 2013, the University of Bergen also launched an online course: Natural Resources Management. That same year, the Norwegian Ministry of Education and Research also established an expert committee to review possibilities and challenges MOOCs could represent in Norway. The commission made several recommendations to the government where they encouraged greater support for digital learning initiatives and new teaching formats (NOU 2014:5).

Subsequent years saw the development of more MOOCs in Norway, and as of May 2016, there are 25 courses listed on the Norwegian MOOC list website mooc.no. Compared to what we see in the U.S. and some of the European countries, there has not been any great uptake of MOOCs from Norwegian institutions. Only 2% of leaders at higher education institutions in Norway had MOOCs as part of their strategy in 2014 (NADLHE, 2015). Participation in such courses was not widespread either: 6% of students had taken a MOOC, while 8% of faculty had done the same.

## 1.4 Topic of investigation and research questions

In this thesis I seek to explain why MOOCs have been developed in Norway by way of investigating what value courses were perceived to help realize and which contextual factors that were important to course development.

While many institutions in the world now offer MOOCs, the value and purpose for doing so do not seem entirely clear (EADTU, 2015, Hollands & Tirthali, 2014). Producing a MOOC is time consuming and creating such a course almost invariably involves multiple actors working together, contributing hundreds of hours (Hollands & Tirthali, 2014). Producing a course is also often costly, and in their article “Why do institutions offer MOOCs?”, Hollands and Tirthali (2014) point out that the time and money that goes into creating a MOOC must be justified with some expected benefit. They go on to point out that it is “curious that MOOCs have taken hold without much evidence as to whether they are effective in improving participants’ skills and knowledge, or in addressing other objectives, and without evidence of their economic value” (Hollands & Tirthali, 2014, p. 2).

The research topics for this study grew out of an observation that as people in the media and higher education sector engaged in public discussion and attempted to explain why MOOCs had become popular, they often pointed to very different factors within a wide range of objectives or contextual factors. For instance, some attributed the rise of such courses to venture capitalists looking for new ways to make money, while others talked about it as a way of enhancing learning outcomes for disadvantaged college students. It seemed like MOOC as a concept became popular for several different reasons depending on who was asked. The concept encompasses a rich offering of courses and has not yet stabilized (Bates, 2015). Although “MOOC” is sometimes discussed as though it were a single phenomenon, there seem to be various different objectives for wanting to offer these courses.

Furthermore, it appears particularly relevant to do a separate study about this topic in Norway as it appears that the Norwegian higher education sectors does not exhibit all of the traits that are commonly used to explain the popularity of the MOOC phenomenon abroad, particularly in the United States. Understanding what Norwegian MOOCs represent in terms of innovation and what role the Norwegian context plays in their development can contribute to

a richer understanding of the MOOC phenomenon and its perceived possibilities and challenges.

The research questions for this thesis are:

1. *How are Norwegian MOOCs understood as innovations?*
2. *What are the driving and limiting factors for development of Norwegian MOOCs as public innovation?*

### 1.4.1 Understanding of innovative potential

With the first question I seek to find how MOOCs are understood as innovative, more precisely what value they were perceived to help realize. Innovation literature often characterizes innovation as meeting a need or solving a problem, but a common unified understanding of the objective of MOOCs seems to be absent (Hollands & Tirthali, 2014). What are the problems that MOOCs are thought to help solve? What makes MOOC a worthwhile endeavour? To study this, I talk to the people who made the choice to develop Norwegian MOOCs and ask them what motivated them to create their courses. As mentioned, some of the contextual conditions in the Norwegian higher education sector are quite different from what we see in other countries where the MOOC phenomenon has taken off, for instance in terms of how institutions are funded. Conditions may be sufficiently different that some of the motivations seen abroad will be less salient for creators of Norwegian MOOCs. After collecting accounts on objectives and motivations for creating MOOC I add a layer of analysis to the stated motivations to find what the motivations say about what course creators saw as the innovative potential of MOOCs.

For the analysis of the first research question I apply an innovation typology framework commonly dubbed “The 4 P’s of innovation”, as presented by Francis and Bessant (2005). This typology holds that there are four dimensions of innovation, and that a new initiative may be more or less innovative along all four dimensions. The dimensions are product innovation, process innovation, position innovation and paradigm innovation. Discussing Norwegian MOOCs in light of these four dimensions helps us understand how they can be understood as innovative.

With the first research question I hope to achieve a clearer understanding of how MOOCs are understood as innovative, by studying what the creators of these courses have been trying to achieve with their projects. Learning more about this can provide us with better ideas about what potential such a course format holds and to approach how it might be used to create value in the future.

## 1.4.2 Driving and limiting factors

With the second research question I seek to find out how we may understand the development and implementation of the courses, aside from attributing the course the specific motivation of the creator. The goal is to find out which factors that have contributed to successful course development and which factors that may have made their realization more difficult. The first research question explains why Norwegian MOOC projects were started, whereas this questions explores how they were made possible.

Public discussions of the MOOC phenomenon often point to contextual factors around courses to explain them, often drawing a close association between MOOCs and the economics of higher education (Selwyn, Bulfin & Pangrazio, 2015). The phenomenon is often explained within a frame of rising costs in higher education and competition between higher education institutions (Selwyn, Bulfin & Pangrazio, 2015). However, the Norwegian higher education system is largely public, tuition free and has a high degree of stable funding, making it seem less likely that Norwegian MOOCs have been driven by competition. If this is the case, then further discussion around digital course formats in Norway will benefit from understanding development of such courses in a specifically Norwegian context. To make this possible I will focus specifically on the fact that the innovation in this case takes place within the public sector.

Discussion of the second research question will be structured after the factors that Windrum and Koch (2008) found to be important in terms of explaining innovation in the public sector. These were the role of public entrepreneurs, incentive structures, bottom-up/top-down innovation, influence of New Public Management and the influence of consumerization. By using these categories as a framework I can get a better sense of the factors that are especially relevant to Norwegian MOOCs as public innovations.

## 1.5 Structure of the thesis

The present chapter has outlined what massive open online courses are and how they have developed as a phenomenon, and I have explained the research agenda for the thesis. Chapter 2 is a background chapter which provides a more in-depth introduction to online learning and MOOCs in Norway and abroad by relaying findings from relevant reports and research. In chapter 3 I outline the theoretical framework that will be used to discuss findings. Chapter 4 outlines my methodological choices and how I proceeded to collect and analyze data. Chapters 5 and 6 relay findings and discusses these for the first and second research question respectively, by using the theoretical frameworks outlined in the third chapter. Finally, chapter 7 concludes the thesis and discusses the implications of the research project.

## 2 BACKGROUND AND LITERATURE

In this chapter I will present background information and literature which provides context for the later discussion chapter. I begin by outlining a few basic traits of the Norwegian higher education system. Next I present some key points and findings about MOOCs and digital learning in Norway. I move on to present findings from research about MOOCs and objectives for making them in the United States and Europe, which is where the brunt of MOOC development has happened so far. In the last section of the chapter I present the MOOCs I have studied in this thesis.

### 2.1 Traits of the Norwegian education system

The second research question in this thesis asks which factors that drive and limit development of massive open online courses in Norway. All courses were developed in the context of the public higher education sector in Norway, and I shall therefore give a brief outline of the Norwegian higher education system.

In 2015 there were 260.547 registered student in Norway, and 86% of these were studying at public institutions (Norwegian Centre for Research Data, 2016). There are 25 public education institutions and 8 of these are universities, while the rest are university colleges or scientific colleges. There are no private universities in Norway, though there are several private university colleges.

A significant difference between the Norwegian education system and many others is that Norwegian public higher education is free of charge. The government allots money to universities to cover roughly 77% of its expenses while the rest has to be secured from external sources (The Ministry of Education and Research, 2015). About 70% of this sum is guaranteed as basic funding and is intended to be stable over time. The other 30% component of the funding is based on results on metrics to do with education and research. The indicators for how well institutions do in regards to education are the number of students who pass

exams and the number of international students. These two metrics in the results based component are open ended, meaning that there is theoretically not a limit to how much support an institution can generate from these indicators if they improve their results. The Ministry of Education and Research (2015) concedes that many of the primary objectives of higher education institutions cannot be stimulated through separate indicators, as the contributions would be difficult to measure. Strategic and academic leadership at the institutions are therefore tasked with managing the complexity of the objectives.

Tuition is not a source of income for universities and they must therefore take care to secure external funding and do well on the results metrics in order to cover expenses. It is less common for Norwegian universities to receive the kinds of large donations that we see with top universities in the U.S. and U.K. However, public higher education institutions in Norway have a long tradition of offering continuing education, for which they sometimes do charge tuition. The most common course format in continuing education is a seminar based model, often in combination with online teaching (Tømte et al., 2015). There is considerable variation between public institutions in terms of the extent to which their continuing education programmes/courses are financed through tuition (Tømte et al., 2015).

## 2.2 MOOCs and digital learning in Norway

The Norwegian Government has supported the integration of ICT in higher education through a number of years through the Norwegian Agency for Digital Learning in Higher Education (subsequently abbreviated as NADLHE). This agency is organized under the Ministry of Education and Research and acts as an advisor to the Ministry. Its central activities include awarding grants to technological development projects in the Norwegian higher education sector, developing and sharing knowledge on flexible education and to contribute to better coordination between institutions and industry. Every three years, NADLHE conducts a quantitative survey about how higher education institutions exploit the pedagogical potential of digital technologies. The report is called *ICT Monitor*, and the most recent edition covers 2014. In this section I will relay findings from this report as well as from the Official Norwegian Report on MOOCs.

The Official Norwegian Report on MOOCs was issued in 2014. It was written by an expert committee appointed by the Norwegian Ministry of Education and Research and was titled “MOOC for Norway. New digital learning formats in higher education.” The report describes the development of MOOCs and advised on opportunities and challenges this format represented for Norwegian higher education and competency building in society in general (NOU 2014:5). The committee advised in favour of MOOCs and stated that Norway should capitalize on the potential MOOCs can give as a supplement to or as a part of Norwegian higher education. The committee gave a number of recommendations to Norwegian authorities and higher education institutions about how they might support such initiatives.

In the report, the committee members outline which incentives and drivers they see in the development of MOOCs abroad. They point out that some of the drivers seen in the United States such as strengthening of institutional brand or reducing costs are likely not as strong in Norway, as there is no tuition at Norwegian universities (NOU 2014:5). As each public institution in Norway has a stable income and is not part of a price competition with other institutions, there is less immediate pressure to attract students with a strong brand, cut costs or increase revenue through paid courses (which in Norway’s case would be courses from departments for continuing education). This is not to say that the government might not demand higher cost efficiency in the future.

According to the Official Norwegian Report, Norwegian higher education has not managed to capitalize on the potential of technology to engage students and add a collaborative dimension to learning (NOU 2014:5). Rather, the model is still one of traditional content delivery. While faculty report that they see digital tools for teaching as having potential to provide variation and more engaging learning, digital technologies are mainly used as a supplement to lectures and are not used to revitalize the lecture format to any large extent (NADLHE, 2015).

Norwegian faculty enjoy great freedom in terms of what kinds of digital tools they use, and how and why they use them (NADLEH, 2015). As reported in *ICT Monitor 2014*, leaders and faculty were asked which factors they thought most important to further use of digital tools for teaching. The most important factor was thought to be the work of enthusiastic individuals that were interested in and engaged in implementing new technology (NADLHE, 2015). Another factor was the role that people at the management level can play in implementation of technology-assisted teaching through anchoring initiatives. The third and fourth most

important factors were documentation of good experiences with using technology, along with students' expectations. Interestingly, the factors considered to be the least relevant were "economic incentives" and "expectations about better exploitation of resources".

Norwegian students have an almost exclusively positive attitude to use of digital technologies in higher education (NADLHE, 2015). However, while faculty believe student expectations with regards to technology to be an important driver for use of such tools, students' expectations are not particularly high. They do not appear to be strong drivers for use of technology in studies and learning (NADLHE, 2015). A study by the OECD Centre for Educational Research and Innovation from 2012 found that at that point, European students' expectations in relation to technology use and connectivity in education were not changing dramatically. In fact, students were somewhat reluctant to see technology bring radical transformations in teaching and learning (OECD, 2012). What they wanted from the technology was to benefit from the added convenience and productivity it might enable.

The NADLHE report on digital learning in Norway further notes that the institutional regulating framework and facilitation of using and developing technology for teaching is dominated by loosely anchored initiatives. As mentioned, faculty have a great degree of freedom with regards to use of ICT so and volunteerism and personal engagement are central. At the same time, initiatives are seldom supported by formal regulation such as economic incentives, courses to enhance digital competency or demanding a certain degree of such competency (NADLHE, 2015). The report states that while there is a plurality of motives for using digital technologies, attitudes towards such use seem mainly positive. Still, it remains up to the individual how to deal with it, and it appears that there is a lack of certain relevant support functions.

10,45% of faculty that responded to the survey behind ICT Monitor 2014 fit the profile of a so called "superdig" respondent, meaning that they had high scores i 5 of the categories measuring engagement and positive views on digital technology for teaching. The report states that this group in all likelihood encompasses both innovators and early adopters (as laid out in Everett Rogers' famous model for diffusion of innovations). Superdig respondent are more than 100% as likely to give positive answers about the advantages of digital technology for teaching (NADLHE, 2015). As may be expected, the will to try new things was higher for this group.

Also, superdig respondents differ most markedly from other respondents in their beliefs in the high importance of *formal support* for digital technologies for teaching, such as strategies, development plans and integrating use of such technology into learning plans for subjects (NADLHE, 2015). According to the report, it appears likely that leaders in departments that have strategies for use of digital technology and anchor efforts to implement them are the ones who are also have the most positive views on use of such technology (NADLHE, 2015).

## 2.3 MOOCs in the United States and Europe

In this section I will present some background information on MOOCs in the United States and Europe and particularly which objectives that have been identified for creating and developing these courses. I begin by outlining findings from two complementing surveys on MOOCs that were conducted in the U.S. and Europe at around the same time, and then present findings from a detailed study on motivations for offering MOOCs in the United States.

Every year going back to 2003, The Babson Survey Research Group have conducted a survey in which they track online education in the United States using the same battery of questions. The latest edition of the survey is reported in *Online Report Card – Tracking Online Education in the United States* (Allen & Seaman, 2015). The reports have been tracking MOOC development in the U.S. since 2012. The European Association of Distance Teaching Universities (subsequently referred to as EADTU) has issued a report (Jansen & Schuwer, 2015) where they used many of the same questions as the Babson Research Group have been using in their surveys of the U.S. The EADTU report surveyed perceptions and objectives of MOOC at European higher education institutions and what the main drivers behind MOOCs are in the region, drawing comparisons between the results found in the United States and Europe.

At the moment, the MOOC landscape is still dominated by the United States, both in terms of courses and service providers (Jansen & Schuwer, 2015). However, the total number of institutions in the U.S. that either have had or have been planning a MOOC is rather low: In 2012, 2.6% of higher education institutions currently had a MOOC (Allen & Seaman, 2015). This increased to 5.0% in 2013, to 8.0% in 2014, and stood at 11.3% in 2015. Many

institutions have decided against a MOOC, while some are still considering the matter. 58.7% of higher education institutions report that they have no plans for a MOOC, while 27.8% remain undecided. It appears that many of those who were undecided over the last few years have since decided not to create a MOOC, and this particularly applies to smaller institutions (Allen & Seaman, 2015). While there is a decrease in interest in MOOC from institutions in the United States, the report from EADTU (Jansen & Schuwer, 2015) shows that the interest in MOOC is still growing in Europe. There has been a rise from 58% to 71% in number of institutions that either had MOOCs already or were planning to introduce them (Jansen & Schuwer, 2015).

Regarding institutional support just 29.1% of chief academic officers believe their faculty accept the value and legitimacy of online education (Allen & Seaman, 2015). A general tendency is that academics at institutions that already have many students in distance learning programmes are more positive: 60.1% of those at institutions with over 10,000 distance students report that the faculty see value and legitimacy in online learning, contrasted with 11.6% of the leaders of institutions with no distance offerings (Allen & Seaman, 2015).

The following figure (next page) from the EADTU report (Jansen & Schuwer, 2015) shows the distribution of which objectives for MOOC creation that were the most important to higher education institutions in the United States between 2013 and 2014, and in Europe in 2014.

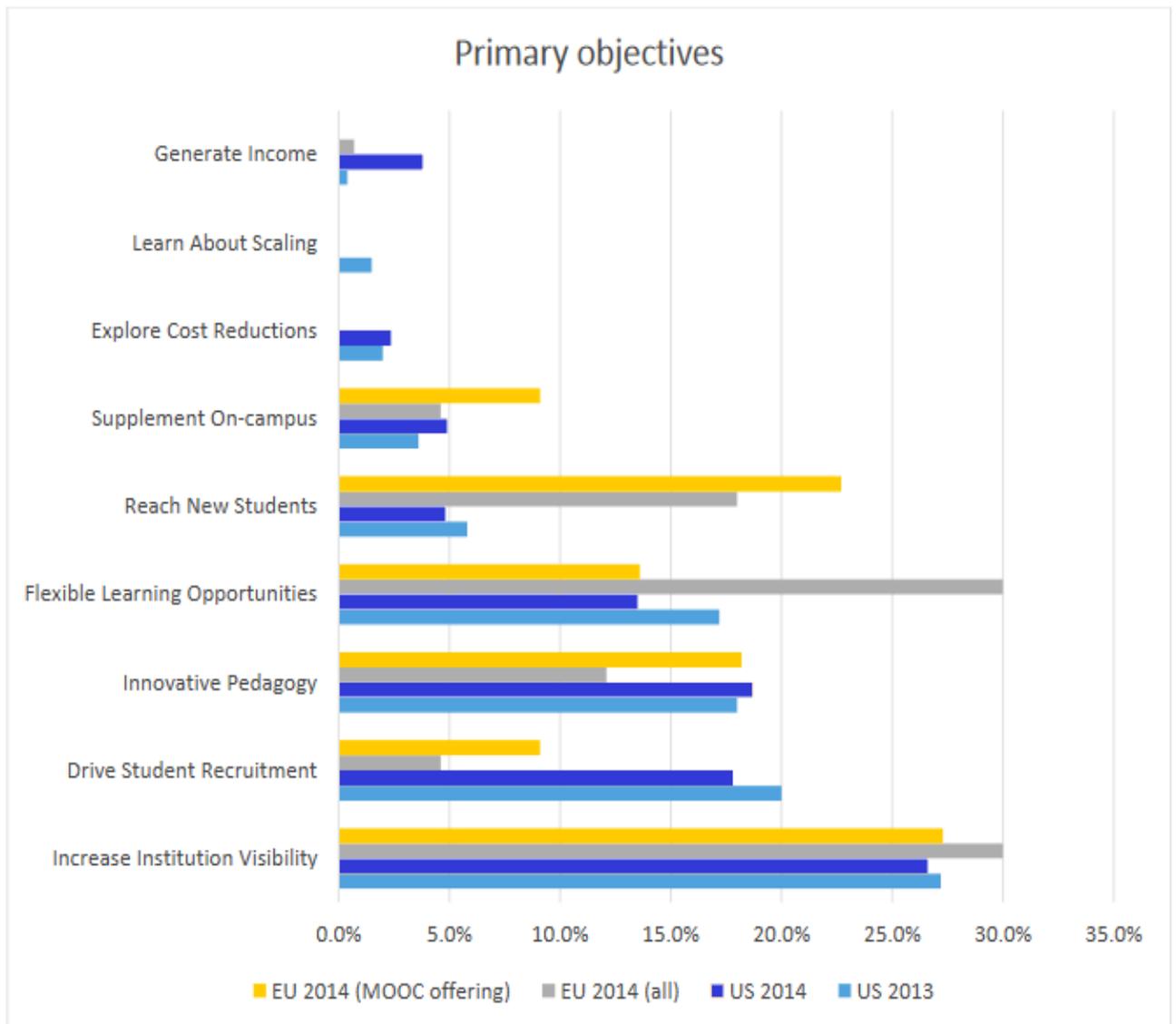


Figure 2: Primary objectives in the United States and Europe for offering MOOCs (Jansen & Schuwer, 2015).

The dominant objective was to use MOOC for reputational reasons and increasing the visibility of the institution. While the next primary objective of American institutions that offer MOOCs was student recruitment, in Europe it was reaching students and creating flexible learning opportunities that were the other most important objectives. Direct financial motives were not dominant in either region. In fact, more than half of American university administrators don't think MOOCs are financially sustainable (Allen & Seaman, 2015). This is a doubling since the same question was asked in 2012. However, more than half of institutions in Europe believed MOOCs could be sustainable (Jansen & Schuwer, 2015).

In their article *Why do institutions offer MOOCs?*, Hollands and Tirthali (2014) refer to the American results reported in these findings and comment that it's surprising to find that learning and pedagogy did not seem to be prioritized objectives. On the other hand, the survey only asked for the primary objective and it is thus possible that teaching quality was a secondary objective for some institutions (Hollands & Tirthali, 2014).

Jansen and Schuwer (2015) point out that a possible explanation for the differences between how U.S. and European institutions view MOOC is that there is a big difference between the regions when it comes to funding for higher education, with Europe having more government funding. European institutions also seem to be experimenting more with online pedagogy and different types of MOOCs in order to fulfil various rationales. Over 80% of European institutions believe MOOCs are an important way for institutions to learn about online pedagogy, while the agreement with this has fallen from 44% to 28% in the U.S. between 2013 and 2014 (Jansen & Schuwer, 2015).

While public funding structure may have played an important part in European MOOC development, European governments were not found to be actively involved in MOOC projects (Jansen & Schuwer, 2015). There were several reasons for this: They had other priorities, did not have a clear vision for what they might want to do with MOOCs or were experiencing financial problems. Also, whether to get involved with MOOC was primarily the responsibility of institutions. When governments did show involvement they were motivated by improving educational quality and to broaden the access to higher education.

While the reports from EADTU (Jansen & Schuwer, 2015) and the Babson Research Group (Allen & Seaman, 2014) asked participants about their primary motivation in a survey, Hollands and Tirthali (2014) conducted interviews to find why institutions in the United States offer MOOCs. They identify six major overlapping goals for MOOC initiatives:

- extending reach and access
- building and maintaining brand
- improving economics by reducing costs or increasing revenues
- improving educational outcomes,
- innovation in teaching and learning
- conducting research on teaching and learning.

## Extending reach and access

The most commonly identified goal was to extend the reach of the institution to a wider audience and improve access to education (Hollands & Tirthali, 2014). This goal was mentioned by 65% of institutions offering MOOCs. Some maintained an altruistic goal of ensuring global access to quality educational experiences, whereas others were trying to reach a particular group or solve a specific challenge regarding access. Many instructors cited their passion for their subject and their wish to spread their knowledge to the public. MOOCs were expected to improve access by virtue of, among other things, “broadcasting” knowledge, by improving the flexibility of study for current students or for professionals, allowing more students to take the most popular courses, increasing access to specialized and skilled professors.

However, while many institutions state that improving access to education is an important goal, there seems to be little real incentive or financial justification for doing so, except for providing MOOC to participants who can pay for them (Hollands & Tirthali, 2014).

## Building and maintaining brand

41% of interviewees from institutions that were offering or using MOOCs cited branding, positioning or attracting students as a strategic goal for the MOOC project. The institutions that were using MOOCs to build or maintain their brand strategically showcased programs, research and specialties where they believed themselves to be leading, or wanted to stake a claim to world class expertise in their field. Also, some institutions believed that branding efforts through MOOCs would lead to more enrollment in the institution’s ordinary courses.

## Improving economics

38% of institutions that were offering MOOCs wanted to use the courses to lower costs or increase revenue. This seemed to be more important to public universities than to private universities (Hollands & Tirthali, 2014). There was widespread agreement that development of MOOCs needs to have some kind of financial justification if it is to continue, as creating such courses is expensive and takes up a lot of faculty’s time. At this point, MOOCs have not lead to lower costs or increased earnings, but interviewees imagine several ways this can happen, given time: Material can be reused for several years or across instructors, campuses or even institutions, MOOCs can replace on-campus courses which reduces the need for

faculty time and facilities, they can be useful recruitment tools and they can increase the throughput of students.

### Improving educational outcomes

38% of institutions offering MOOCs believed MOOCs could lead to improvements in educational outcomes. Some thought this would occur as a direct consequence of the courses, while others believed the effect would be indirect. Indirect improvement would mean that new and relevant teaching methods and strategies that were learnt through offering a MOOC were transferred into on-campus teaching. Some of the mechanism through which MOOCs were believed to improve learning outcomes were by providing feedback, increasing motivation because of gamification, and providing adaptive and personalised learning.

A number of people interviewed by Hollands & Tirthali state that the most significant impact of MOOCs has been that they have motivated instructors to rethink how they teach and have facilitated professional development of faculty that might otherwise have been resisted. At the same time, many point out that changes in practice are not positive by default, and there is a lack of evidence about whether MOOCs are actually enabling better learning experiences or outcomes. Many also pointed out that the potential for adaptive or personalised learning is far from being realized: At this point it takes too long to analyze the data from MOOCs to be able to adapt courses or to be able to offer individual paths.

### Innovation in teaching and learning

38% of interviewees saw MOOCs as vehicles for experimenting with pedagogy and models for higher education, with innovation as an end goal in itself. In contrast, the other five goals that were reported entail innovation as a means to a particular end. The experimentation and experience with MOOCs and online learning was seen as preparation for an uncertain future, with institutions not wanting to “get left behind”. MOOCs were also thought to be a disruptive phenomenon that might help universities become more competitive simply by shaking up the status quo and making institutions reconsider established practices.

Still, many people remained unconvinced that MOOCs would bring anything much to the table in terms of innovation. Those with experience in online education and online learning resources pointed out that a lot of MOOC developers are “re-inventing the wheel” and

repeating the missteps and successes of online learning over the past decades. They saw the scale aspect of MOOCs as what set it apart from other online education but did not feel that MOOCs were currently taking advantage of this trait.

### **Research on teaching and learning**

While there is considerable overlap between formal research and ad hoc efforts to improve teaching and learning, research in this context points to work that is being conducted by individuals who consider themselves researchers first and foremost and aim to publish their work. There are several initiatives under way to use MOOCs as a source of data on the behaviour and performance of participants, and also as a vehicle for delivering interventions.

## 2.4 Presentation of the courses covered in the study

The following table outlines which MOOCs this study is based on. I give a more detailed presentation of the courses after the table.

| Year | Course name                           | Host institution   | Primary developers   |
|------|---------------------------------------|--|--|
| 2013 | <b>Technology and societal change</b> | Norwegian University of science and technology (NTNU)                          | <ul style="list-style-type: none"> <li>❖ Professor teaching the course in the department for continuing education</li> </ul>   |
| 2014 | <b>Flexphil</b>                       | University of Oslo   | <ul style="list-style-type: none"> <li>❖ Unit for digital learning at University of Oslo</li> <li>❖ University lecturer responsible for the subject examen philosophicum (“ex.phil.”)</li> </ul> |
| 2014 | <b>Smart Learning</b>                 | Norwegian University of science and technology (NTNU)                          | <ul style="list-style-type: none"> <li>❖ The professor who also made “Technology and societal change”</li> <li>❖ Project team and Department for Teacher Education at NTNU</li> </ul>            |
| 2014 | <b>Medical arithmetic</b>             | University of Stavanger  | <ul style="list-style-type: none"> <li>❖ Professor teaching the course in medical arithmetic.</li> <li>❖ Unit for digital learning at the University of Stavanger</li> </ul>                     |
| 2014 | <b>What Works?</b>                    | University of Oslo   | <ul style="list-style-type: none"> <li>❖ Professor in development studies.</li> <li>❖ MOOC studio at renowned university in the United States.</li> </ul>  |
| 2015 | <b>Mathematics MOOC</b>               | University of Tromsø and Norwegian University of science and technology (NTNU) | <ul style="list-style-type: none"> <li>❖ The Norwegian Centre for ICT in Education</li> <li>❖ Project teams at the University of Tromsø and NTNU.</li> </ul>                                     |
| 2016 | <b>Music Moves</b>                    | University of Oslo   | <ul style="list-style-type: none"> <li>❖ Unit for digital learning at University of Oslo</li> <li>❖ Professors at the Department of Musicology.</li> </ul>                                       |

Table 1: The MOOCs in the study.

### 2.4.1 Technology and societal change, NTNU (2013)

The course deals with the effects use of technology has on society. It was instigated by a professor II at NTNU, and is based on material from a book they have previously written and a course they were teaching at the university's department of continuing education. The professor had good contact with employees in BIBSYS, which is an administrative agency under the Ministry of Education and Research that delivers products and services related to data systems. At this point in time, BIBSYS were developing a new learning platform that the professor agreed to test, which they did by creating a MOOC. The plan was always to make the course open in order to allow more people to engage with material pertaining to digital learning. The course was a one-person operation and did not receive any funding. The course was relatively simple and emphasized that students engage with each other and various digital tools, making heavy use of social media, texts, blogs and Youtube videos, with less use of the instructional videos that have come to be associated with MOOCs. The course has been discontinued.

### 2.4.2 Flexphil, University of Oslo (2014)

Flexphil was developed as an online learning resource for *examen philosophicum* (popularly termed ex.phil.), which is an introductory subject in philosophy that is mandatory for all Norwegian university students. Flexphil was made with a particular group in mind, namely the hundreds of students that elect to take ex.phil. as self studies. While the course literature places a lot of emphasis on reading original texts, Flexphil features professors in dialogues where they discuss and contextualize the material, as well as self tests. The course was instigated by UiO's department for digital learning in collaboration with the department of philosophy. Flexphil is fully automated and still available online.

### 2.4.3 Smart Learning, NTNU (2014)

Smart Learning was started by the same person that made the course Technology and societal change. The course focuses on digital learning and innovative pedagogy and is primarily aimed at teachers. It was made in collaboration with the university's department for teacher education. As with the first course, Smart Learning is based on a book the professor had written. This course received funding from the university and several other sources, which

allowed the professor to build a team around the course. The extra resources has allowed for more multimedia resources to be specially produced for the course. The course is still running, and the project group does everything related to maintaining the course.

#### **2.4.4 What Works: Promising practices in international development, University of Oslo (2014)**

What Works was the first international MOOC from Norway and was created by an esteemed professor in development studies at UiO. It focuses on success stories from the aid sector and aimed to attract students from all over the world, particularly being marketed through contact networks reaching students and academics in development studies, professionals from the international NGO sector and policy makers. The course was largely an autonomous project, but the professor had help from contacts at a renowned university in the United States that has experience with creating MOOCs. The University of Oslo's department for digital learning was involved in some parts of the project. What Works ran once and it remains to be seen if the course will be given again and in what form.

#### **2.4.5 Medical arithmetic, University of Stavanger (2014)**

The course is meant to give nursing students and health professionals the opportunity to revise material about proper calculation of medicine dosage. The professor responsible for the campus version of the course in medical arithmetic was aware that students tend to struggle with the course and fail often. They were thinking of ways the university's unit for further education could provide a private exam for students who failed the course so many times that they lost their right to have the exam provided any more times by the university. The University of Stavanger has a unit responsible for integrating digital tools and methods into the universities' teaching activities, which the professor had been in touch with in the past through making other online resources. In a discussion about the course on medical arithmetic, the leader of the digitization unit suggested to make a MOOC about medicine calculation that could be a resource to students and others who wanted to practice. They proceeded to create the MOOC as a joint effort. It is fully automated and still running.

## 2.4.6 Mathematics MOOC, University of Tromsø and NTNU (2015)

Mathematics MOOC is a course aimed at teachers teaching mathematics to forms 1.-7. The course deals with strategies and techniques for teaching mathematical understanding effectively to children. This project began when the Norwegian Ministry of Education and Research declared that they wanted to launch a program to ensure continued education for 10.000 teachers over a 5 year period. The Centre for ICT in Education is a sub-unit of the Ministry which has responsibility for supporting ICT use in secondary education and higher education programmes in teaching. The ministry tasked the Centre for ICT with creating an online course for continuing education for mathematics teacher, providing financial resources and a project mandate. The Centre has been responsible for the project management side of creating the MOOC, while the University of Tromsø and University College in South Trøndelag (HiST - now part of NTNU) have been responsible for the academic development and implementation of the course. The University of Tromsø is now the course owner and will continue to run the course for at least a couple more years.

## 2.4.7 Music Moves, University of Oslo (2016)

Music Moves is the second international Norwegian MOOC. It was created as collaboration between the Department of Musicology and the university's department for digital learning. The course deals with the science of movement and music, which is a field where the Department of Musicology is world leading. The academics from the department developed the course content while the department for digital learning had the project manager role and gave input on the instructional design of the course. They also had some contact with the international platform on which the course was implemented in order to receive feedback on their course development process. During the development of the course, the creators took care to create somewhat timeless learning materials that they might integrate with the campus version of the course. Music Moves ran during the spring of 2016 and it remains to be seen if it will be given as an international MOOC again.

This concludes the background section and presentation of the MOOCs that form the basis for this thesis. In the next chapter I turn to the theoretical perspectives I have applied to study the courses.



# 3 THEORETICAL FRAMEWORK

This chapter will outline the theoretical concepts that informed data collection and analysis and are used in the later discussion chapter. The aim of this study is to cast light on why and how Norwegian MOOCs have been created and developed. In order to do this I use two theoretical frameworks, one for each research question.

I begin this section by defining how the term *innovation* is to be understood in this research project. Also, the internet is the central enabling technology for MOOCs and I will therefore subsequently provide a brief outline of some theoretical concepts on the internet and its place in development of innovation that will be revisited in the discussion chapter. I then outline the traits of the two frameworks I use to discuss the research questions, namely Francis & Bessant's (2005) "4 P" innovation typology and research findings by Koch and Windrum (2008) on public innovation.

## 3.1 The internet and development of innovation

Innovation literature often draws a distinction between invention and innovation: While invention happens when someone comes up with a new idea, innovation is the process of implementing the idea and making it work in a real world context (Fagerberg, 2006). This is how the term innovation will be understood in this thesis: as a process of applying the idea to create value. Further, what we think of as innovation can often be a gradual process, rather than something that occurs as a fixed point in time (Fagerberg, 2006). Gradual and continuous improvement is referred to as incremental innovation, whereas more new concept for the organisation or even the industry as a whole are referred to as radical innovation.

While innovation is often described as solving a particular problem, Tidd and Bessant (2013) note that not all fields develop and innovate along established trajectories towards a well-defined end-point. Some innovation takes the form of a process of emergence, where the broad parameters are visible but the dominant design is not visible yet. Instead of a dominant design there might be a rich field of technological possibilities, business models and potential

players from which a dominant design gradually emerges (Tidd & Bessant, 2013). They point out that the scope for service innovation has grown enormously with the rise of the internet, and then add “not for nothing is it sometimes called ‘a solution looking for problems’”.

### 3.1.1 Push and pull

New products or services tends to be the result of one of two main forces of innovation: New product or service features are either introduced into a market as a result of new technical capabilities, in the hope that demand for these new features will arise as soon as people learn of them. The other possibility is that there is already an identifiable demand in the market which leads to the development of the new product or service features. These two forces are respectively termed *technology (or knowledge) push* and *need pull* (Tidd & Bessant, 2013).

Innovations come about through *technology push* when technology or processes can be developed in such a way that it allows for the creation of something which customers or users have not anticipated that they might want (Tidd & Bessant, 2013). The design seldom appears fully developed though, the process of technology push often involves exploration and numerous smaller breakthroughs that are followed by periods of elaboration and development. After a while, some key characteristics may stabilize.

The world wide web could be an example of technology push, as it introduced new capability without immediately solving a recognized need in civilian society (as opposed to the original application of the early internet to facilitate military communication). Indeed, the phrase cited above on “a solution looking for problems” is a pretty good description of innovation that comes about through technology push. Other examples of technology push can include Wikipedia, 3D TVs or smart phone applications (apps): these were developed because it was technically possible and it seemed that people might appreciate their features once they were introduced into the market.

While technology push creates many possibilities, these require some demand to take root, and so need is the complementary force to knowledge push (Tidd & Bessant, 2013). Need pull is the main force behind innovation when there is a problem that needs solving or an identifiable demand in the market, and the product or service is developed to respond to this. Netflix is a good examples of this: While it had been possible to buy digital films individually

up until then, there was a lack of legal ways to stream them. Demand was clearly present through the wealth of illegal streaming sites around the web. Netflix also introduced a subscription model for paying for films, which had shown itself to be popular for music through Spotify. Smart house technology for the elderly is another example: As we age, many people start experiencing problems which makes it difficult to live at home and stay safe without supervision. Seeing as most people enjoy living at home rather than at an institution, smart technology that helps elderly people live at home despite problems with memory or movement are helping to solve an existing problem with clear benefits.

### 3.1.2 Web 2.0

“Web 2.0” is a term that was introduced around 2003-2004 as a common description for various new phenomena that arose on the internet around this period (Cormode & Krishnamurthy, 2008). Some of these include the growth of social networks, two-way communication and diversity in content types. Web 2.0 is characterized by richer methods of user interaction, new technology and a fundamentally different philosophy with regards to how the internet is used. According to Cormode & Krishnamurthy (2008), the essential difference between Web 1.0 and Web 2.0 is that there were few content creators in Web 1.0 with the vast majority of users simply acting as consumers of content. We can use the encyclopædia as an example of how the web 1.0 and web 2.0 modes differ: In the early days of the internet there were efforts to digitize encyclopædias and put them online to increase access, whereas when Wikipedia was introduced in 2001, everyone could submit entries to a commonly crafted encyclopædia and edit the contributions of others. The latter approach to the encyclopædia is an example of how the internet is used in the Web 2.0 era, characterized by active participation and taking advantage of technological possibilities (Cormode & Krishnamurthy, 2008).

## 3.2 A typology for dimensions of innovation

To answer my first research question about how Norwegian MOOCs are understood as innovative, the 4Ps model of innovation space will be used as a framework in order to facilitate discussion. The aim is to have a clearer understanding of what motivations that have

been most important for creating Norwegian MOOCs, and what these can tell us about what kind of innovation MOOC is perceived to be in Norway.

As explained in the introductory chapter, there appear to be many different understandings of MOOCs and their objectives. To address the question of why Norwegian MOOCs were made and what understanding of MOOC as innovation that this reflects, I use a typology of innovation as an aid for analysis and discussion. This allows for the analysis to not just simply re-iterate motivations for creating MOOCs, but to add a higher analytic layer that also discusses what the stated motives can tell us about what value it is that the MOOC format can help capture.

Discussion of what constitutes innovation and how one might categorize different types of the phenomenon is a key concept in the literature of innovation (Rowley, Baregheh & Sambrook, 2011). While early conceptions of the innovation concepts was tied to manufacturing of products and their features, there has later been a development where more types of innovation are recognized. This became particularly salient in the 1980's, when Japanese manufacturing became able to compete with American industry through innovation in their production processes.

Yet, there are many models, frameworks, classifications, and definitions of types of innovation. A common way of describing innovation is that it is either the changes in what organisations offers the world (through product or service innovation) or in how they create and deliver what they offer (process innovation) (Francis & Bessant, 2005). Francis and Bessant (2005) believed that this definition is insufficient and propose two other areas where innovation is possible, namely market positioning and business paradigm. With this addition they proposed a “4 P's model of innovation” (where the 4 P's stand for *product*, *process*, *position* and *paradigm*).

While many have proposed further typologies of innovation, Rowley, Baregheh & Sambrook (2011) proposed a typology which aimed to integrate previous definitions, models, frameworks and classifications. In doing so, they found that other classifications and frameworks can be mapped onto the 4 P framework which Francis and Bessant proposed in 2005. They note that the 4 P model was the only model to introduce the important concepts of

position and paradigm innovation. The 4 P's model is used in this thesis as it includes important categories that other models lack and yet is able to encompass other typologies.

Francis and Bessant (2005) outline four dimensions of the innovation space:

- Product innovation, where organizations change what they produce
- Process innovation, where changes are made to how the product or service is made or delivered
- Position innovation, where the services or products are introduced in new contexts
- Paradigm innovation - where the change is in the underlying mental model framing what the organization does.

These dimensions are not exclusive categories but rather directions where all of them may be pursued to a larger or lesser degree, so any given innovation might have traits which makes it possible to argue that it may fit with several of these categories (Francis & Bessant, 2005). In a study where researchers reviewed examples of public sector innovations using a similar framework, they found that a significant percentage of examples spanned more than one type of innovation (Bloch & Bugge, 2016). Innovations can range between the incremental - doing something better - and radical - doing something differently- on all four dimensions (Francis & Bessant, 2005).

The 4 P's model can be visualized in a circle with an axis for each dimension of innovation:

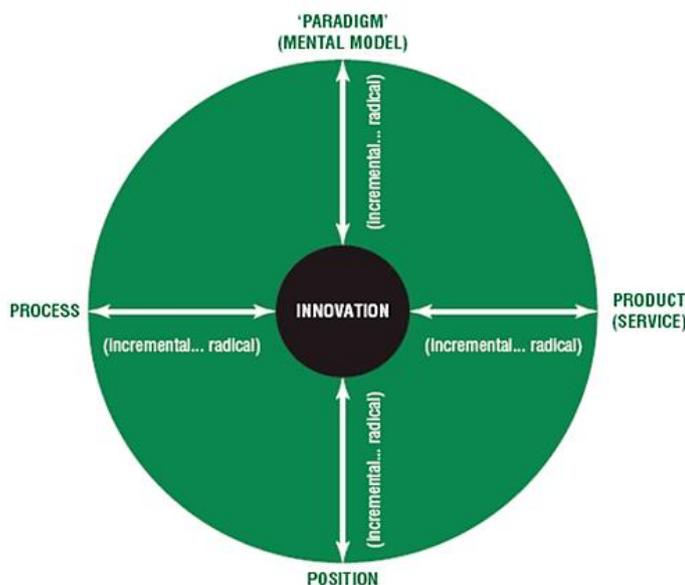


Figure 2: Visualization of the “4 P’s” model of dimensions of innovation. Retrieved from “4 Ps explanation”, p. 6. Copyright 2005 by Tidd, J., Bessant, J. & Pavitt, K.

### 3.2.1 Product/Service innovation

A product or service is what an organisation offers the world, and so product or service innovation is about changes in what is offered (Tidd & Bessant, 2013). A particular trait of service innovation is that they are sometimes created in real time, making it difficult to separate the process from its output (Francis and Bessant, 2005). It is somewhat difficult to say if MOOC should be viewed as a service or a product. Traditional campus courses can be considered a service, as the services of sharing knowledge and providing feedback happen largely in real time. Certainly, many MOOCs emphasize the presence of teachers and make adjustments to the course as the course progresses. On the other hand, a central feature of MOOCs is that they make courses asynchronous: they allow an unprecedented separation between the *creation* of a learning experience and the outcome of student's actually *experiencing* it. Viewed in this way, a MOOC can be said to create a spectrum where a course may be more or less service-like or product-like, where a course was previously more unambiguously a service. While recognizing that MOOCs may score differently on such a spectrum, in going forward I will refer to MOOCs as products for simplicity's sake.

In 1995, Goldman et al. predicted that the internet would come to be the greatest resource for product innovation. They predicted that if it were used to access customers and use mass-customisation techniques it would be possible to create a distinct product for each customer. But considering the internet, what difference does it make in terms of innovation? In one sense, the functionalities of the internet pervades the entire concept of MOOC, and cannot be separated from it. For this reason, in order to understand what it is about MOOC that is perceived as innovative, we must understand which aspect of the internet's capability that is seen as the motivating function.

Some features of the world wide web are inherent to its basic functionality: It can be accessed by anyone with an internet connection and web browser, making geographical position irrelevant, and content can be stored permanently on servers and so can be accessed at any time. Taking an existing service and using the web to support it can be innovative in its own right in that the basic functionality of the web as a platform makes it possible to access information regardless of time and space. Whether it *is* innovative depends on how useful this is to people. Beyond this though, the degree of innovation is a question of how much new value that is created by taking advantage of the functionality enabled by the internet.

Introducing new functionality can make a web based course a different kind of learning experience than a traditional course. For instance, the use of video as a lecture format can add relevant value if the length of the videos are more optimized for typical attention spans than traditional lectures, or if they are better able to teach concepts through audiovisual additions to the lecture. These can be animations, use of sound, montages etc. A lesson might also be something other than a lecture, for instance it can be a visual field trip where instructors can tell stories in environments other than the classroom. The following images show some examples of how HarvardX’s massive online open course ChinaX used video to add value to the teaching of Chinese history through location filming, animation and inspection of museum artefacts.

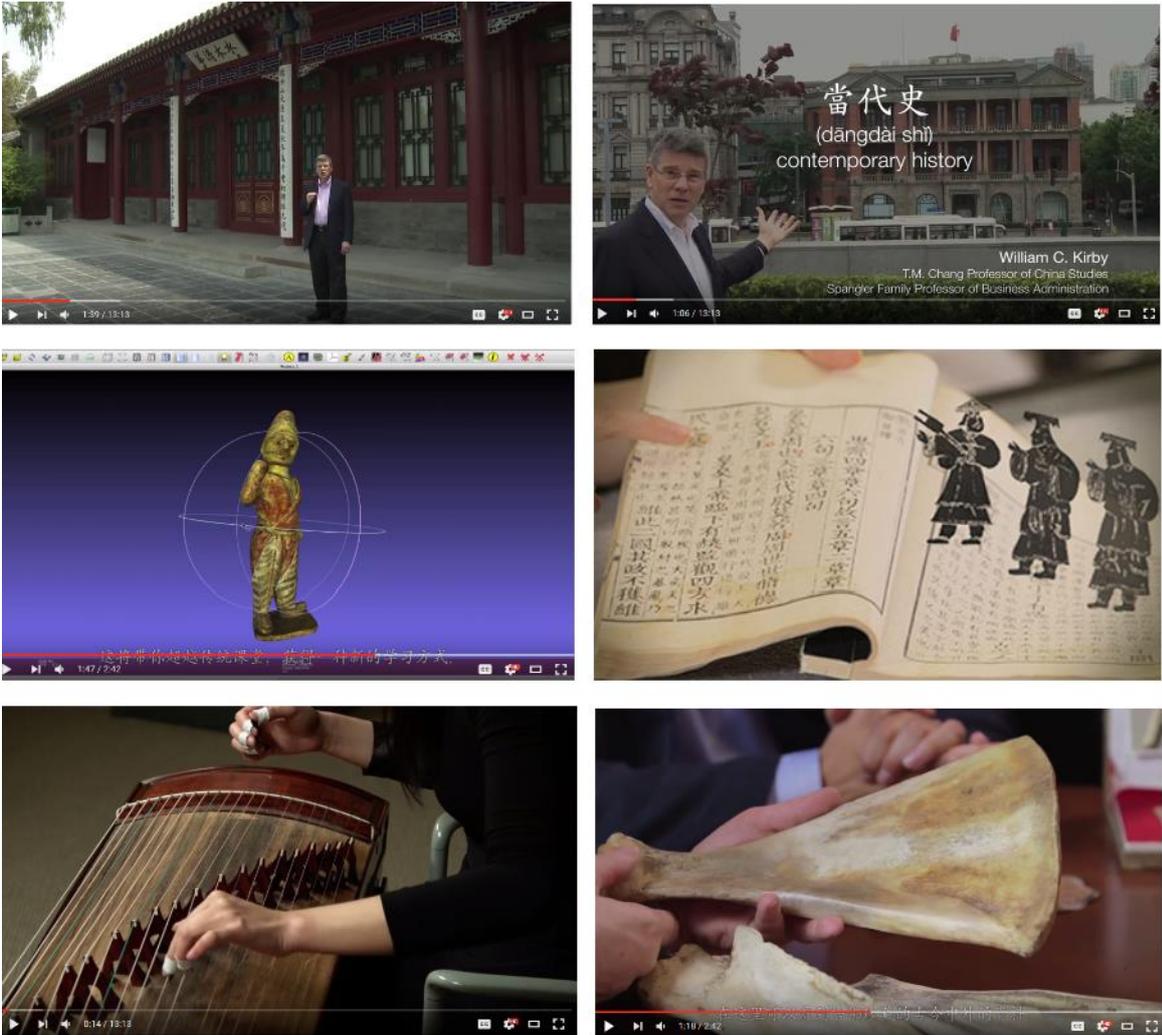


Figure 3: Screenshots from the MOOC ChinaX. (Source: edx.org, 2015).

### 3.2.2 Process innovation

A process innovation is innovation in how an offering is created or delivered (Tidd & Bessant, 2013). Each process in an organisation is a system with defined inputs, transformation processes and outputs (Francis & Bessant, 2005). There is room for improving how existing processes operate, by removing some kind of waste and optimising for high performance (Gallagher et al., 1997, in Francis & Bessant, 2005). For instance, new technologies may add precision, improved training may increase employees' ability to act in accordance with instructions and mapping processes can identify time that is being wasted in unnecessary activities (Stalk Jr. 1993, in Francis & Bessant, 2005). Much of the 'lean thinking' concept is based on this principle (Francis & Bessant, 2005).

Incremental process innovation can take the form of improvements in key performance parameters, like cost reduction, quality enhancement, time reduction, etc. Radical process innovation involves a shift towards a new process route, possibly spanning the entire industry.

As mentioned earlier, it can often be difficult to separate a product from its process, for instance with the provision of a service (Bloch & Bugge, 2016). In this study I regard the immediate value of accessibility that comes of providing the MOOC through the internet as tied to the product aspect of innovation. The way I will use the concept, MOOC as a process innovation can be framed as a way to offer a learning experience while using resources more efficiently. For instance, MOOCs may help reduce costs by allowing faculty to spend less time lecturing if they have made a MOOC which may replace giving variations of the same lecture every year. The development of the course can be done in an intensive period, and the faculty members do not have to be at any specific place or time in order for students to receive the lecture material.

Developing a high quality course can be resource intensive, but the scale of the course and the ability to re-use material might justify the investment over time. An institution does not need to develop all courses by themselves, and by using lectures from other institutions they can free up the time of their own teachers to be able to spend on other teaching activities so that where they once got lectures, they now get lectures and some other learning activity for the same resource input.

Another way in which MOOCs can be framed as process innovation is if those responsible for the course make use of the ability to track and analyze the actions of students within the course, and use this knowledge to change or adapt the course - either as the course unfolds or in a later iteration. Traditional student feedback asks students to reflect on the course after they have finished it, whereas MOOCs allow for studying their interaction with the course in real time and in unprecedented detail. By leveraging this possibility, course creators may create a feedback loop to improve the process of delivering a course.

### 3.2.3 Position innovation

Position innovation has to do with where an offering is targeted and what story is told about it (Tidd & Bessant, 2013). A position innovation can be a change in the context where products or services are introduced. Such innovation usually relates to firms, brands or products, but institutions can go through the same process (Irons, 1993, as cited in Francis & Bessant, 2005). Indeed, Tidd and Bessant use the University of Phoenix's building of large online education businesses to reach different markets as an example of a radical form of position innovation.

Typically, positional innovation is about how an established product or service produced by an established process is brought into a new context (Francis & Bessant, 2005). This is the incremental kind of positional innovation. A positional innovation doesn't necessarily affect the product itself but rather the meaning of the product in the eyes of the potential customer (Kim & Mauborgne, 1999a, Kim & Mauborgne, 1999b and Kim & Mauborgne, 1999c, as cited in Francis & Bessant, 2005) and/or the market segments that have been chosen as targets.

Positional innovation can also involve repositioning a brand or targeting a new market segment. Successfully creating a new market would be a radical positional innovation.

In regards to position innovation it seems clear that MOOCs are able to expand the reach of courses to new markets, as evidenced by the hundreds of thousands of people who have completed courses from universities far away. However, simply being open to everyone does not make MOOCs positional innovations unless they actually provide value to previously underserved markets.

### 3.2.4 Paradigm innovation

A paradigm innovation is a change in underlying mental models about how an organisation conceives of what they do and how they frame it (Tidd & Bessant, 2013). Such innovation can revolutionize a market or redefine an organisation's mission. Paradigm innovation is about rethinking assumptions and changing the idea about what the product is at a fundamental level. These changes result in seeing new challenges and opportunities and letting go of others (Francis & Bessant, 2005).

Although they concede it is difficult to make clear boundaries, Francis and Bessant see two types of paradigm innovation. One is innovation in inner-directed paradigms, meaning changes in capability, targets, organisational values and people management. The other kind of paradigm innovation is outer-directed paradigms. Such innovations of paradigm relate to the business model, which is the system of coherent, explicit constructs that are used to understand firms and shape development (Senge, 1992, as cited in Francis & Bessant, 2005). Outer-directed innovation is a way of thriving in a competitive environment, and so the test of the business model is whether it provides a framework to gain and sustain a positive advantage. This makes it more extensive than radical position innovation.

Radical paradigm innovation are entirely new business models. The development of internet solutions for a range of business areas such as banks, travel etc during the 1990's is an example of radical innovation in paradigm (Evans and Wurster, 2000, as cited in Francis & Bessant, 2005).

In terms of MOOC, they could be paradigm innovations if they somehow represented a "game changing" concept and new way of organising higher education. I've previously mentioned that creating value from MOOC is about how features of the internet are used to add value to a course. For MOOC to be a paradigm innovation, these features should enable new models or conceptions of learning.

### 3.2.5 Applicability of framework

While Francis and Bessant's 4P typology of innovation has been found to handle integration with many other popular typologies (Rowley, Baregheh & Sambrook, 2011), the authors'

descriptions and conceptualisations of the model seem to focus on the strategic decisions of private sector firm management rather than on single projects that come from within the organisation.

Although perhaps conceptualized with a traditional private sector understanding of innovation in mind, all the elements of the “4 P’s” typology are applicable to the public sector: services or products are developed and delivered, there are processes to do so, there is an intended user market and there are mental frameworks surrounding what public organisations fundamentally do. The dimensions in the framework can also be coherently applied to more spontaneous initiatives that aren’t necessarily instigated by top management: these spontaneous initiatives too have the potential to create value along the dimensions that are outlined in the typology.

### 3.3 Driving and limiting factors in the creation of Norwegian MOOCs

With the second research question I seek to learn more about how Norwegian MOOCs have been implemented. In order to do this I will seek to map which factors that have driven the projects forward and which that have imposed limitations. The development of MOOCs is often discussed in the context of the competitive higher education sector of the United States where gained prominence, but in the previous chapter we saw that MOOCs in Europe have developed differently from in the United States. Seeing as we can observe such differences, I believe it is appropriate that a study of the development of Norwegian MOOCs then pays particular attention to the factors that are distinct to the Norwegian environment.

A notable trait of the Norwegian higher education system is that it is largely public and tuition free, and most Norwegian MOOCs released so far have been created by public higher education institutions. While the typology of innovation outlined in the previous section is sufficiently conceptual that it might be applied to public innovation so long as it is coherent, more practical frameworks may risk missing integral perspectives because of the inherent differences between private and public sector innovation. Private sector innovation is driven by ideas of competition and focused decision-making, whereas public sector innovation has different - and often conflicting - drivers (Tidd & Bessant, 2013). Rewards and incentives

may be absent, or they may be different from what one finds in the private sector. Public innovation also often faces a problem of “centre/periphery” relationships where much innovative experimentation takes place close to where services are delivered, while the “rules of the game” and financial resources are controlled by the centre. In order to make sure that my analysis is able to pick up on these factors, I apply a framework that deals specifically with innovation in the public sector.

I will discuss my findings on driving and limiting factors for Norwegian MOOCs in light of findings from Koch and Windrum (2008). In their research on public innovation they identify the following factors as especially important to determining when and how public innovation occurs and whether it is successful:

- Public sector entrepreneurs
- Incentive structures
- Bottom-up innovation and top-down innovation
- Impact of New Public Management on innovation
- Implications of consumerism

I will now give an outline of Koch and Windrum’s (2008) central findings related to these factors.

### 3.3.1 Public sector entrepreneurs

Entrepreneurs are found to be essential to innovation in the public sector. Public sector entrepreneurs are creative individuals who challenge the status quo and seek to change the world around them. They are also risk takers who are well connected within social networks and can draw upon social and financial resources necessary to develop new innovations. These connections are important because no individual has all the resources necessary to carry out an innovation all by themselves. An existing set of skills and contacts are therefore important traits of successful entrepreneurs. Also, a common conception is that while private sector entrepreneurs tend to be motivated by profit, public sector entrepreneurs are often motivated by social welfare. However, one should be wary of broad categorizations of why public or private entrepreneurs innovate, as their motivations are in fact often complex.

In terms of MOOCs, public entrepreneurs can be anyone who exhibits the traits described above and who leverages their resources to create and develop MOOCs. They need not have any particular motive for engaging with MOOCs, but take an active role in taking the course from idea to implementation.

### **3.3.2 Incentive structures**

On the one hand, public institutions need to address an insatiable desire for better services. On the other hand, there is the desire that public expenditure should not increase. Underlying innovation drivers that one commonly find are changing demographics, social changes and social problems arising from new types of work and new lifestyles. Many innovations in the public sector are responses to such underlying pressures. In addition to these, innovation may be driven by more local or specific problems. According to Koch, there are a number of important factors that facilitate and aid the uptake, development and dissemination of innovation within public sector organizations. Incentive structures and support mechanisms that allocate resources to support creativity are particularly important. There need to be systems that promote, stimulate and disseminate outputs of creativity - namely innovation. In addition to an environment that encourages creativity and innovation, there needs to be surrounding environment to support competency building.

Incentive structures with regard to MOOCs are particularly tied to the resources and support mechanisms that are available to such projects. Also, the general incentive structures at the institutions or the higher education sector in general can influence the development of courses and act as driving or limiting factors.

### **3.3.3 Bottom-up innovation and Top-down innovation**

Public sector entrepreneurs and innovations can be found at different hierarchical levels. “Top-down” indicates that a process was initiated high up in the hierarchy, such as by top management or policy makers, whereas “bottom-up” indicates that it was initiated by someone with a lower position in the hierarchy, such as public employees. Top-down innovations tend to be initiated with changes in regulations or governance structures and may be oriented towards achieving greater efficiency in delivery of services. Bottom-up

innovations, on the other hand, may be more focused on expanding the quality of supplied services or developing a *new* service. Top-down innovation tend to be championed by politicians and take the form of generic political goals, with implementation handed over to the institutions concerned. From this perspective, implementation can be seen as a passive process where there is a demarcation between political leadership and bureaucrats.

However, the existence of bottom-up innovation challenges this notion. Public service employees need not be subordinate bureaucrats, but can be entrepreneurs in their own right. Far from being conservative, public sector managers may champion quite radical changes in public services. While politicians often need to be generalists with a basic understanding of many different fields and sectors, public employees can be highly educated and specialized within a particular field. One should be mindful of potential conflicts between policy makers and public entrepreneurs. These may stem from different perspectives of agents that are operating on different hierarchical levels.

According to Koch and Windrum (2008), there are two important issues to consider about bottom-up innovation. The first is under-reporting, as far less attention is paid to this kind of innovation. This has ramifications for how local initiatives are incentivized and rewarded. The second issue is policy. If service entrepreneurs play an important role in developing public sector services then policy should recognize this and confer on them the necessary rewards and responsibilities.

MOOC projects may begin anywhere in the hierarchy in higher education. I will consider projects to be top-down if they begin at the level of policy makers or the top management level at higher education institutions. Projects are considered bottom-up if they are instigated at the levels below this, such as by teaching professionals.

### **3.3.4 Impact of New Public Management on innovation**

New Public Management (NPM) is driven by the belief that the public sector should adopt private sector management skills and practices in order to deal with the fact that demand for public sector services is ever increasing while expenditure needs to be kept under control. Thus, the focus of NPM becomes ones of cost efficiency and of customer satisfaction. NPM has inspired changes that have transformed many areas of the public sector and their focus on

innovation. Under NPM, state money is distributed through performance systems that reward organisations for meeting targets. NPM favours development of certain kinds of innovations over others. Notably, it favours innovations that support decentralization, privatization and contracting out of services. It promotes competition between public providers and other organisations, it develops consumerism and separates political and administrative decision making from the service production.

A full analysis of the distribution structures in the Norwegian higher education system is beyond the scope of this study considering that the data I collect will be centered around the level of individual courses. NPM will be considered to have been influential to the extent that cost efficiency and customer satisfaction are emphasized or that distribution of resources happens through performance systems.

### 3.3.5 Implications of consumerism

As mentioned, new public management leads to a “consumerization” where consumer satisfaction is a central factor and citizens are replaced by customers. This raises important issues, such as what the relationship between actors in civil society ought to be. Second, in order to make good choices, consumers need a high level of knowledge. It is far harder to become an empowered customer of knowledge-intensive services such as health services, and the analogy between public services and consumer goods might break down rather quickly when one considers the differences between making informed health decision and purchasing a new car. Consumerization may prove a double edged sword: It assumes that with everyone making informed decision on their own behalf, the result will be greater overall cost efficiency across services. Yet it is unclear who is really responsible for the results when this focus on individual choice co-exists with the expectation that governments should solve problems for the taxpayers, and they might have a different perspective. To illustrate, Windrum uses the example of smoking: If an individual wants to continue smoking and government believes it would be better for everyone’s health that there was less smoking, how far can they go in regulating smoking?

In terms of this study, consumerization will be a driving or limiting factor to the extent that student satisfaction impacts the development of courses, or if it seems that MOOCs exist in a market where students are treated as customers that can “shop” between courses.



# 4 METHODOLOGY

In this chapter I explain the methodological choices I have made and outline how I proceeded in collecting and analyzing data material. The chapter begins with the study design and an account of how I selected what to include in the study. I go on to outline choice of data material and how I collected it. I then discuss my analytical approach and end by commenting on validity of the thesis as well as some ethical and methodological concerns.

In the research questions I ask how MOOC is understood as innovation by those who made them and which factors that drove and limited the courses' development. In order to gain an understanding of this I decided to analyse accounts about several courses from people who created Norwegian MOOCs. The study is based on a comprehensive set of triangulated data sources where accounts have been collected through interviews, public articles, funding applications and projects evaluations.

## 4.1 Study design

I have designed this study as a multiple cross-case analysis, with the massive open online courses themselves are the case units being studied. The aim is to understand what factors that are common or different across cases and what these can tell us about how and why MOOCs in Norway are made. The following table (next page) gives an overview of the cases and data sources that the study is based on:

| Course                                | Interviews   | Public documents (News articles, blogs etc)                  | Applications, reports etc  |
|---------------------------------------|--------------|--|--|
| <b>Technology and societal change</b> | 1 interview  | 4 (newspaper/magazine articles)                              | None available   |
| <b>Flexphil</b>                       | 2 interviews | 4 (newspaper/magazine articles)                              | 1 application  |
| <b>What Works</b>                     | 2 interviews | 3 (2 newspaper/magazine articles, blog entry)                | 1 application  |
| <b>Smart Learning</b>                 | 1 interview  | 2 (newspaper/magazine articles)                              | 1 application  |
| <b>Mathematics MOOC</b>               | 2 interviews | 1 (4 newspaper/magazine articles, 2 presentation slide sets) | 1 evaluation report  |
| <b>Medical arithmetic</b>             | 2 interviews | 2 (newspaper/magazine article, web page news entry)          | 1 application  |
| <b>Music Moves</b>                    | 2 interviews | 3 (blog entry, press release, web page news entry)           | Unable to reach the person that had the final version of the application |

*Table 2: Data material in the study.*

According to Yin (2014), case studies investigate contemporary phenomena within their real life context - especially when the boundaries between phenomenon and context are not clearly evident. As such, it is especially relevant to use the case study design if we deliberately want to cover contextual conditions because we believe that they might be highly important to that which we are studying (Yin, 2014). As the MOOC phenomenon is highly contemporary (- indeed, the phenomenon has only been discussed publicly for about four years) and part of the research question is focused on contextual factors around the MOOCs, a multiple case study is appropriate in this regard.

Yin (2014) also states that the case study method is especially relevant compared to other methods in situations where the main research questions are “how” or “why” questions and if the researcher has little control over behavioural events. The research question for this thesis asks how and why Norwegian MOOCs have been developed, and so falls under the appropriate category. Furthermore, in studying the MOOCs which have been made in Norway, I am studying real-life projects over which I have had no influence. Thus, a case study design is appropriate as I have not been able to control events.

### 4.1.1 Choosing cases

I will now explain the reasoning behind my choice of courses to include in the case study and how my understanding of how best to study them changed during the time of data collection.

I did not have the capacity to cover all MOOCs that has been made in Norway up until the point when I made the decision. As case studies are not supposed to be representative of other individual cases there was no need to choose cases randomly or to ensure representation. I therefore chose cases on the basis of how I thought they might add to answering the research questions.

In the beginning of the project I thought to only interview and collect documents mentioning the professors and staff that had been directly involved in the creation of the MOOC, believing that I could separate “the creator” and “the host institution”. I have chosen the course itself to be the object of study and so chose to talk to the professors because early reviews of information on MOOC in Norway suggested that they are usually the ones who have instigated and MOOCs up until this point. As I worked to collect information on the various MOOCs and talked to course designers to set up interviews, it became clear that this separation between “instigator” and “host” was an assumption that did not accurately describe all cases, and this led me to modify my understanding of the role institutions play in development of MOOCs. They too are actors that can be actively involved in the creation of the courses, even if they play different roles than the enterprising academic that decides to make a MOOC. I further discovered that professors were not the only ones to play a central role in course creation and so included their close collaborators in the project.

The choice of case studies was made on the basis of wanting to understand how MOOCs had come to be created in Norway, and thought it would inform the research objective to talk to people behind the earliest MOOCs. Thus all the earliest courses became candidates, namely Technology and *Societal Change* (2013) and *Smart Learning* (2014) from NTNU and Flexphil (2013) and *What Works* (2015) from UiO. While *What Works* is considered to be UiOs first MOOC because it was created with an open audience in mind, *Flexphil* actually also fits a liberal definition of a MOOC: While created as supplement to the campus version of the mandatory philosophy and ethics course all Norwegian students are required to take, it

has always been open to anyone who wanted to access the course and is able to handle an unlimited number of participants.

In choice of cases, a further consideration was to include several courses from the same institution so as to obtain different perspectives from within the same setting. Studying two pairs of MOOCs that have come out of the same institution provides an interesting opportunity to see whether the newer MOOC was somehow informed by the former. Studying two courses from the same institution also would give a richer picture of the institutional setting and add the possibility that findings might strengthen each other. I already had two MOOCs from the University of Oslo in the sample. The newest MOOC at the point of case selection, *Music Moves*, was also from the University of Oslo. This course was included in the case sample to further add to this line of research: to see if any connections could be drawn between the experience creators and host institution had with this MOOC and with the previous MOOCs at the same university.

Another consideration in the choice of cases was to elect some cases for the sake of variety and contrast. While some courses listed so far are about subjects of general interest and intended for a large audience, some Norwegian MOOCs seemed to have a very narrow thematic focus and to be intended for audiences from specific backgrounds. Two more early cases of such MOOCs were therefore included in the sample to offer a contrast to the more general ones: One was *Mathematics MOOC*, a course from University of Tromsø and NTNU (University College of Southern Trøndelag in 2014) aimed at teachers, on teaching mathematics in elementary school. The other was a course from University of Stavanger about calculating appropriate doses of medicines, aimed at nursing students and health personnel.

In addition to trying to choose cases for variation in theme and scope, the cases also reflect different origin stories. I had met the creator of the University of Oslo's first MOOC WhatWorks through participating in the blended campus version of the course. Also, I knew the person behind the two NTNU MOOCs through having been hired to execute the survey on user satisfaction for the NTNU course Technology and Societal Change. I therefore had a degree of prior understanding of the motivations these two professors had had for starting their courses, and knew that they had initiated the courses on their own because they were enthusiastic about trying. Early investigations into the creation of other MOOCs also

suggested that early such courses were often made by people who took a personal initiative based on their personal or professional interest.

However, that was not the case for all courses. Researchers who were knowledgeable about ICT education in Norway made me aware of the course *Mathematics MOOC*, which had a rather different origin story: It had been initiated by the Ministry of Education, which had tasked the Centre for ICT in Education with developing it, and they since recruited two institutions that collaborated on its creation and maintenance. Thus it was that this MOOC was included in the sample, to further investigate this information and possibly have a contrast to the origin of the MOOCs that came out of personal initiative.

My understanding of the courses in the selection was in no way complete, but conducting a selection based on time of creation, hosting institution and apparent origin story ensured that there was a good chance that cases could both support and contrast each other in a multi-case analysis.

## 4.2 Data collection

I sought to capture course creators' motivations and their understanding of the process that they have been a part of. It is therefore useful to use qualitative methods, as such methods are often useful when the aim is to capture experiences and narratives.

As mentioned, using multiple sources of evidence is a key trait of case studies. Case studies lend themselves to using various sources of evidence, and this adds to the quality of studies by allowing converging lines of inquiry (Yin, 2014). This thesis builds on two main sources of data: 11 accounts from people who were interviewed in relation to 7 different MOOC cases, and documents related to the same courses.

Yin (2014) points out that it is important that data triangulation leads to covering the same material, as opposed to using different methods which address *different findings*. True triangulation means that a case's findings are supported by multiple sources. This study adheres to this principles by using documents and posing interview questions that center around the same themes, with findings as part of the same pool of data for the later analysis.

## 4.2.1 Interviews

According to Yin (2014), the interview is one of the most important sources of evidence for case studies. Talking to participants allows the researcher to capture their experience and obtain rich descriptions of their reasoning. This was particularly necessary in order to answer the kind of research questions that I had posited, as these questions dealt with how participants had reasoned to reach the decision to create a course and how they attributed events and contexts to have driving or limiting effects on their projects.

While collecting articles about the various courses I were to study, I identified which people had had key roles in developing the MOOCs according to these sources. Recruitment of participants was done through sending out emails to the creators of the relevant MOOCs. I was fortunate enough that all 12 participants who were solicited to contribute to the thesis agreed to do so, and this resulted in 10 interviews. Most interviews took place during March 2016. 7 participants were interviewed at the campus of the University of Oslo, one at a coffee shop in downtown Oslo, and four participants were interviewed over Skype. Interviews typically lasted between 50 and 75 minutes. I recorded the interviews with a dictaphone and transcribed the audio material into text.

Data from participants were collected through semi-structured interviews. In order to let the participants speak as freely as possible and facilitate longer accounts rather than short answers, the interview guide was used as a checklist of themes that I wanted to address in the interview, rather as a strict guide. According to Howitt (2010), semi structured interviews tend to provide exhaustive and rich data for investigations. The interviews always began with me asking the participants about their background and the role they had played in creating the course in question. I then asked them to recount how the idea for the project appeared and who was involved, and then how the project developed and who was responsible for which aspect of it. I would then spend some time trying to find out about the interviewee's understanding of MOOCs and motivation for creating the course. In the later half of the interview I would ask them about the contextual factors around creating the MOOC such as financial support, how their colleagues reacted to the MOOC, how it had been received at the host institution and their thoughts about experimenting with new formats.

After asking participants about motivations for creating courses, I would also mention some specific motivations that I had seen mentioned in literature and ask if these played a role. A few times I'd find that although the motivation has not been mentioned spontaneously, participants that were prompted would say that a motivation had been important, and so the prompt elicited a new account.

## 4.2.2 Documents

The most important use of documents in case studies is to augment and corroborate evidence which has been collected from other sources (Yin, 2014). Documents were chosen on the basis of relaying information about how given MOOCs were developed, showing who was involved and relaying opinions and statements about motives for creating the courses. I analyzed the documents to find what they presented as the central reasons why developing a massive online open course would be a good idea. I also noted any comments made in news articles regarding driving and limiting factors in course development.

Many of the documents used for the analysis were public documents such as newspaper or magazine articles relating to the various courses. Some of these articles were from national media, while others were from the papers of the universities hosting the MOOCs. In addition to news articles there are also a few blog entries and presentations in the sample as well as some entries from news bulletins on university websites. I also got access to applications for funding or project evaluations outlining the courses. Some of these are not published online and so were obtained through participants. As documents created for or by a public organ relating to its activities, the public may access them (Freedom of Information Act, 2006, §3-4).

Yin (2014) points out that when reviewing documents it's important to remember that they are often made with a specific audience in mind. In the case of the documents used in this study, some of the news articles from university specific news publications may have had faculty in mind as their audience and this may have influenced their coverage. On the other hand, blogs which are meant for the general public may tell a simplified story which doesn't necessarily reflect the author's full range of thoughts on the subject. The applications that were reviewed were written to justify that a project deserved funding or to evaluate how a project had fared in terms of initial goals. These documents explicitly state the motivations

behind courses, but I have taken into account that applications may overstate or underplay certain motivations to better fit criteria that funding bodies use to evaluate them, and that evaluations may reflect a shift in focus from initial motivations in the project.

### 4.3 Thematic analysis

Thematic analysis helps researchers develop overarching themes in their material. This material can be transcribed interviews or others forms of qualitative data. The method is descriptive rather than theory forming (Braun & Clarke, 2006). That is to say, thematic analysis can be conducted with specific theory in mind or with the aim of discussing data in light of certain theories, but at the end of the day the analysis aims to describe the material. The analysis does not aim to generate new theory, as opposed to analytical approaches such as Grounded Theory.

I decided to apply thematic analysis for this thesis because it allows the data to be sorted into categories. This was a helpful way of ordering the findings when they would be discussed in light of categorical frameworks. Furthermore, thematic analysis is a method which only deals with that which is accounted by informants or through other parts of the data. The method yields relatively straightforward categories which have not been subjected to interpretation where the method itself places directives on themes in the analysis. An example of such a method of analysis might be critical discourse analysis, where the method itself dictates that material be subjected to interpretations concerning power and agency. I was planning to integrate findings into theoretical frameworks, and using thematic analysis allowed me to apply these without having to manage another layer of analysis which was mandated by the method.

Braun and Clarke (2006) state that thematic analysis begins with the researcher familiarizing herself with the data and then codes it line by line. After this stages she looks for patterns in the codes and categorizes them, using the codes to form thematic categories. Lastly, she re-assesses the themes and reviews them if necessary. I adhered to this approach when analysing the data.

Thematic analysis can be both theory driven and data driven. Theory driven thematic analysis codes the data with a specific theory in mind, while data driven analysis codes according to the data and its contents (Howitt, 2010). The data collection in this thesis project was somewhat theory driven, as I had decided on theoretical frameworks to do with typology of innovation and public innovation, and was using these as a basis when crafting the interview questions. However, when analyzing the material for prevalent themes I did not relate findings into the framework during the earliest stages of the analysis. Rather I synthesized the points raised in texts and interviews into thematic clusters, looking for converging or contrasting narratives. I then arranged these categories according to which categories in my theoretical frameworks which they might inform or be informed by.

## 4.4 Comments on credibility

So far I have discussed my choice of design and methods and how I conducted the study. I will now discuss some of the factors that influence the credibility of the study and how I have taken these factors into account.

### 4.4.1 Validity

Validity refers to how well a study really reflects that which it attempts to reflect (Yin, 2014). Stake (2013) argues that the best way to achieve good validity in case studies is through triangulation in interpretation of data. Each important interpretation of the data should have grounding in the collected material, ideally in several places. This is something I have been mindful of throughout the analysis, namely to build thematic categories that are supported by several parts of the data material. I have also taken care to critically review the meaning of the themes as I contrast them with the theoretical framework, so as to use the frameworks as tools that add rigour to findings and avoid adding meaning that is not supported by the material.

It is also important that the researcher manages to keep their own perspective from influencing the research process, for example participants in interviews (Yin, 2014). Conversations can lead to mutual and subtle influence between interviewer and interviewee, with the result of an undesirable colouring of the interview material. Yin (2014) points out that this is a threat that one may not be able to overcome fully, but being sensitive to its

existence should allow for better interviews. I have stayed aware of this phenomenon and done my best to be mindful of my subjectivity as a researcher. For instance, it was surprising to find just how challenging it was to control my body language during interviews so as not to signal agreement or disagreement in subtle ways that often come naturally in ordinary conversations.

#### 4.4.2 Generalization

Case studies do not attempt to generalize their findings to populations, and do not consider their cases to be a “sample” a such (Yin, 2014). Generalization often brings to mind the statistical kind of generalization, where findings are supposed to allow inference of probabilities in the population being studied. This approach is incorrect when dealing with case studies (Yin, 2003). It is the MOOC projects themselves and their creators that are the objects of study, but they have not been chosen to be individually representative of all others.

Case studies rather attempt to generalize the theoretical concept which the study is founded on. This is the basis of analytic generalization, which Yin (2014) explains by way of an analogy with an experiment: While a single survey tries to make inferences about a sample, a single experiment does not. Rather, the theoretical propositions in a case study can be considered a form of hypothesis, and the study seeks to build support for or falsify the theory with the data. Yin (2014) characterizes the aim as “(...) establishing the domain to which a study’s findings can be generalized.”

#### 4.4.3 Ethical concerns

As I would not be collecting sensitive information, I believed that I was not required to report my project to the Norwegian Centre for Research Data (NSD). Before I started interviews I checked whether I might be required to do so after all, and it turned out that because I would have material with personal information (participants’ names), the project had to be approved by NSD. I applied to have my project moved up in the review queue on the grounds that I was to conduct interviews in the following week. My request was granted and the project was approved.

There are some considerable challenges with regards to securing the anonymity of participants in this study. The main reason for this is that most courses have been created through the efforts of very few people, and so it is easy to infer who the course creators are. For this reason I have tried to the best of my ability to refrain from identifying participants when I discuss findings, although some points I make about individual courses are attributable to a few select people. I have also taken care to choose citations that illustrate points without giving away the identity of the participant.

I have been upfront with participants about the challenges of anonymity and let them know that I intended to share which courses that I included in the case study. All participants received and signed a information and consent form (found in Appendix 3). They are aware that it is possible to make guesses as to who I have interviewed and are comfortable with being part of the study.

In the following chapter I will move on to outline the findings from the study and discuss them in light of theoretical frameworks from the previous chapter and findings from the literature in background chapter (Chapter 2).



# 5 FINDINGS AND DISCUSSION, PART I

The findings for the two research questions in the thesis are discussed separately. In this chapter I present and discuss findings about the first research question: *How are Norwegian MOOCs understood as innovations?*. Findings related to the second research question are discussed in chapter 6.

I have analyzed interviews, news articles and applications for financial support in order to map the motivations for creating massive online open courses in Norway. In this section, I will discuss what understandings of MOOC as innovation that these motivations reflect. In doing this I will use Francis and Bessant's (2005) "4P" typology of innovation as a structural and theoretical framework.

## 5.1 Understanding of MOOC as innovation

This typology presents four dimensions of innovation, where a new initiative might be more or less innovative in all four:

- Product or service innovation, where organizations change what they produce
- Process innovation, where changes are made to how the product or service is made or delivered
- Position innovation, where the services or products are introduced in new contexts
- Paradigm innovation - where the change is in the underlying mental model framing what the organization does.

I will begin by discussing some findings that are general to all four dimensions. The subsequent sections will discuss findings in light of product/service, process, position and paradigm innovation.

## 5.1.1 MOOCs as product innovation

While one can argue that there are many things that are new about massive online open courses, they are still a variation of a *course*. A course is a unit of teaching, often in an individual subject, usually led by an instructor who contextualizes material. To some participants, the MOOC format was an incremental product innovation that allowed them to apply basic functionality of the internet to the traditional course format. Others extended the use of this functionality to create learning experiences that were different and realized a value traditional courses couldn't, suggesting a more radical product innovation.

### Basic functionality of the world wide web

For some of the courses studied, the primary motivations were to capture value from those aspects of MOOC that had to do with the very basics of using the internet as a platform for delivering content. While all courses were open in some sense and most had automated features so the course could handle large numbers of participants, the fact that the course could potentially be *massive* and that it was *open*, seem to have been less salient motivating factors than the *online* aspects of the *massive online open course* concept. This mostly applied to the courses that had been motivated by a specific problem. While the courses were certainly innovative, it seems that the relevant innovative concept was not “MOOC”, but rather the more basic concept on which MOOC is implemented, namely “the world wide web”. One interviewee expresses how using the web as a platform might add value to content delivery:

*“A boring lecture that is uploaded to the web doesn't get any better by virtue of being online. Then you've just documented a bad lecture. We can't give the lecture itself new qualities, but maybe the web platform has some advantages over the auditorium? Being able to repeat [the lecture], that's a unique quality of the digital space. You can repeat it a million times, and also make it accessible to lots of people.”*

To transcend the barriers of time and physical space in content delivery was something that was important to all course creators. Hosting material online frees one from dealing with specific timeframes and it does not require students to be in any given location in order to learn (so long as they have an internet connection).

Two aspects of flexibility of time were particularly salient: All participants believed that an important aspect of MOOCs was that they allowed students continuous access to learning materials. Hosting material online allows students to break and repeat lessons as necessary.

The asynchronous nature of MOOCs also allow the course creators to make lessons that are more appropriate for natural attention spans in that they can make several lessons that are 10 minutes long rather than lecturing for 2x45 minutes. The latter model is used in live lectures because it is more convenient, but few interviewees believed it to be pedagogical.

Flexibility was particularly a motivating factor for why Mathematics MOOC was created, as it was aimed at teachers who were already employed and so it allowed students to study without leaving their job during the day time and also to combine it with their daily schedule as they saw fit. Flexibility of time were the more relevant motivations behind Flexphil and Medical Arithmetic, as the idea was to create a resource that students might use to get a better handle on course materials. In What Works, it was particularly important to the course creator to be able to transcend time and geography so that the course could have participants from many different countries and that they might participate while employed.

### **New functionality and learning experiences**

Some of the Norwegian massive open online courses were started because their creators believed that the MOOC format would allow them to use tools and teaching methods that went beyond putting content online, but which would allow for some entirely new ways of communicating content and teaching, with the new methods somehow being particularly relevant to what they were teaching. This was especially true for the two international courses and the courses about smart learning and technological change.

For the course Music Moves (about music and movement) it was relevant to be able to work in a digital format where content was presented through video. The creators of the course on international development, smart learning and technological change all highlighted the fact that students could communicate with each other as a highly important feature of the course which they tried their best to facilitate through discussion tasks, comment functions etc. The development course focused on success stories from development work and it was seen as a particular value that people from all over the world and in various development related

professions would share their stories and reflections. The courses on technological change and smart learning taught that connecting people was the future of learning - thereby introducing an element of meta-learning. As these courses had a particular focus on digital technology for communication and collaboration, it was particularly relevant that they integrated social media and collaborative elements such as wiki and that assignments often required the use of these technologies and services.

One interviewee said that to them it doesn't really make sense to say MOOC isn't innovative when you see the range of tools being used and the differences in quality between courses. They thought that whether MOOC is new depends on whether tools are being combined in novel ways that offer something new. Another talked about how they believed that creating a good online course was about exploiting the specific qualities of a web course as medium:

*“This is about using the right medium for the right purpose. If you look at it that way, you see that there are some unique qualities to the digital medium. If you focus on those qualities you can find some unique pedagogical opportunities. (...) If you think about it in this way and work on that you'll raise the potential. The obvious thing about the online format are things to do with interaction. Also with simulation, you're able to do advanced work in a safe environment. And you have access to things that you normally wouldn't.”*

The Norwegian massive online open courses that were motivated by being able to add functionality reflect an understanding of MOOC as a product innovation. This understanding builds on the possibility of programming new functions into the course. Examples include pairing lectures with a game that builds subject proficiency or using audiovisual material to transcend the physical limitations on classical lectures such as location and time slots that are optimized for practicality rather than attention. Others used discussion functionality actively in the course to promote learning between students in courses where such communication was particularly relevant to the subject being taught.

These findings seem to reflect the motivation category of “improving educational outcomes” that Hollands and Tirthali (2014) found in their research on motivations for offering MOOCs. They found that this value from MOOCs was expected to range between direct and indirect. This was also true of Norwegian course creators: Some had an idea about how the course would provide a good learning experience more generally, and this was generally the courses that could be considered to have been caused by knowledge push to a larger degree than by

need pull. On the other hand, some courses were created with the explicit goals of helping students achieve better outcomes in a subject.

Courses vary in how much new functionality they exhibit as a result of using the internet as the platform for the course. Some of the courses were made to provide added value by utilizing basic functionality of the internet such as content storing and ubiquitous access, and this motivation reflects an understanding of the MOOC format as an incremental product innovation. Others go further and try to use the digital medium in ways that allow them to create new elements in the learning experience that will be particularly relevant and add value to the subject. The differences between these modes of utilizing the internet can be compared to the differences between “web 1.0” and “web 2.0”, whether the internet was simply used as a platform or whether new technologies building on the basic functionality of the internet were used to connect participants and create new learning tools. Insofar as course creators set out to create learning experiences that use the digital medium to provide functionality which is not feasible in traditional courses, they were motivated to create something which can be considered a radical product innovation.

### 5.1.2 MOOCs as process innovation

A process innovation is innovation in how an offering is created or delivered. Incremental process innovation improves key performance parameters, like cost reduction, quality enhancement, time reduction, etc. MOOC as a process innovation can be framed as a way to offer a learning experience while using resources more efficiently. Developing a high quality course can be resource intensive, but the scale of the course and the ability to re-use material might justify the investment over time. However in this case, all courses were developed for the first time and needed a significant amount of up-front investment.

While improving economics was found to be an important motivation for offering MOOCs abroad - mainly in the United States - (Hollands & Tirthali, 2014), this was not the case with Norwegian MOOCs. A basis for the investigation in this thesis was the notion that the Norwegian context seems to entail weaker demand for MOOCs than in the U.S. and U.K, especially because the financial argument for MOOCs is less salient so long as higher education is free and largely public. Less students stand to gain from MOOCs when the fact that they are free doesn't set them apart from a traditional course, and so students are not

driving demand for cheaper educational opportunities. Institutions stand to gain less if they aren't competing for resources in the form of tuition income in a zero-sum game, but rather has a degree of stability. If institutions are not the ones driving the development of courses it might be unlikely that this should be a concern for faculty, at least considering that they were not in a position where it is their responsibility to secure the economy of an institution.

Indeed, participants were largely motivated by completely different reasons than saving time or money. An interesting exception to this was the course which was initiated by the authorities as a way to ensure continued education for teachers in how to effectively teach mathematics. The authorities launched an initiative to ensure continuing education to thousands of teachers over the span of just a few years. Continuing education for teachers has been expensive as a substitute must be hired and the teachers must travel to attend seminars. In more rural areas it simply isn't always feasible to accomplish this because of long travel distances and trouble finding substitute teachers. By creating an online version of the course, teachers could complete lessons in the course at their own convenience and did not have to miss entire days of teaching. Thus both travel expenses and the cost of hiring substitutes were cut, allowing the authorities to provide continuing education to hundreds of teachers at a vastly lower cost than they could have done with a traditional seminar model.

Another finding from Hollands and Tirthali (2014) was that many were motivated to create courses because having a course online allowed them to collect and analyze data about how the course was used by students. This would allow them to gain insights that could be used to change the course in the future, introducing a feedback mechanism into the process of course development. This was not an important factor in Norway. Course creators had some ideas about how they might learn from data collected in the course, but did not follow up on it. Others have had to conduct some research as a condition for receiving funding. Still, this has not been a motivating factor.

Still, there is a potential for MOOCs to help higher education institutions save time if a course can benefit enough of their regular campus students over time that the cost involved in course development might be justified. Some course creators saw MOOC as one element in a shift towards a model where blended learning is the norm. In these cases MOOC as a concept was understood as something closer to a radical process innovation, namely a sector-wide change in work processes around courses.

### 5.1.3 MOOCs as position innovation

Position innovation is typically how an established product or service produced by an established process is brought into a new context. A more radical version of position innovation is to create a new market entirely for one's services. As it relates to massive open online courses, this dimension is about how MOOC is conceived of as an innovation in changing the perceptions of a course or institution or in creating access to a new student market.

#### Building and maintaining brand

Hollands and Tirthali found that building and maintaining the institutional brand was an important motivating factor behind the MOOCs they studied. Building on or expanding a brand is precisely what incremental position innovation is about, but this did not seem to be a common motivation for course creators. Then again, all courses were created as stand-alone initiatives rather than as strategic projects springing out from the institutional leadership. The international courses were the only courses where the course developers saw their MOOC as a chance to represent their institution. In these cases they saw it as a way to make the university and its expertise visible in the global marketplace and to make a contribution to building the institution's brand. Also, the faculty members behind both these courses are considered top researchers in their field and saw the course as important chances to communicate their expertise more effectively to a wider audience.

#### Reaching entirely new groups

One of the factors that set MOOCs apart from previous online courses is their unprecedented scale. The transcendence of space and time means that teachers can reach thousands with their material. Still, some aspects of a course would be impossibly labour-intensive when reaching a certain number of students, such as grading or keeping track of everyone's progress. By implementing the course on a platform that keeps a personalized track of progress and allows for automated grading and/or facilitates peer grading, it is possible to provide a learning experience to thousands of participants without encountering resource barriers.

All courses save for one were strongly motivated by the ability to reach more people than what is possible through regular courses, suggesting an understanding of MOOC as an

innovation that allows them to reach new markets. This is congruent with Hollands and Tirthali's (2014) finding that extending reach and access was an important motivation behind foreign courses.

The possibility of reaching large numbers of people was mentioned by many as an interesting and unprecedented aspect of giving a course. It was mainly in the cases of Matmethamic MOOC and Flexphil that this aspect was central to why the course was made: They both had a specific aim to serve large groups of people. In the case of Flexphil this group was the more than 1000 students that were signed up for the self-study version of the course examen philosophicum ("ex.phil."), a mandatory introductory course in philosophy and the history of science. Self study students relied on the syllabus literature (which emphasized the reading of original texts) and they were not receiving any tutoring or feedback. The pass rate at examinations was so low for this group that it seemed sensible to give them a little extra support in the form of a contextualizing learning resource. In the case of Mathematics MOOC I have already outlined the benefits that were perceived in reaching those who could not be reached before, opening up a previously inaccessible market. The University of Tromsø was one of the institutions that collaborated on the course, and to them it was particularly relevant to not only offer the course, but to learn how to become better at decentralized learning. They operate in a large and decentralized area where the same barriers that existed for teachers due to long travel distances are likely to be relevant to many others. Through becoming better at web-based teaching, the university can open up many new markets and strengthen their position as a regional educator.

While all courses were made with a motive of reaching more people, it varied how important the *openness to all* aspect was as a motivation for creating the courses. With some courses, the motivation was to reach everyone in the public who found the topic interesting, and so the fact that the course was open to all was an important way of bringing the course out there. This tended to be more true of the courses that sprung out of a more exploratory motivation. One faculty member thus describes their motivation for making a course which was open to all:

*"But it really is all about, you have to think a little out of the box, we have to communicate, and we are always accused of sitting at the university, writing things for journals that nobody reads. We do have a responsibility to reach a larger group of people."*

On the other hand, the courses that were made to solve specific problems did not really need to be open to all to fulfil the motivation of why they were created. Still, the fact that they were was a nice added value that came out of the course. For instance, the course on medical arithmetic was made to help nursing students do better in this subject. A variation over this course is part of all nursing educations in Norway, and so it could be useful to students in other institutions as well. What is more, the faculty member who was behind the course could see from e-mail addresses in the registration data that the course was being accessed by people who were working in hospitals.

Many Norwegian course creators were actively trying to make new markets and to reach traditional non-consumers of their teaching who would not previously have had access to it. The shift from a course being “for campus students” to “for everyone who finds the subject matter relevant” is significant, and to the extent that this aspect of a MOOC’s innovative potential was important to why the course was created, it tells us that many Norwegian course creators saw MOOC as a radical position innovation that could open markets.

#### **5.1.4 MOOC as paradigm innovation**

A paradigm innovation is a change in underlying mental models about how an organisation conceives of what they do and how they frame it. Such innovation can revolutionize a market or redefine an organisation’s mission. Many participants in this study saw MOOC as a way to engage with innovation in learning and to build new competencies for the future.

##### **Learning and sharing dimension**

Engaging with the projects covered in this case study allowed the people employed at supporting bodies to transfer some of their knowledge to partnering faculty members. Supporting faculty members in course development was part of their mandate, but they were also specifically motivated to use the experience as a way to become better at their trade and to help others build a new skill set for the future. Both faculty members and people from support functions pointed out that they has appreciated and learnt a lot from working as a multidisciplinary team.

Although the ICT bodies had general overview of the field of ICT in education and had attained some relevant experience, the project provided them with plenty of new experiences and skills. They saw it as an important benefit to their mission that they gained this experience so they could provide better support to other wishing to do something similar in the future.

In one case, the academic who had begun developing the concept for their MOOC decided against soliciting technical support from the ICT body because they lacked previous experience. The academic wanted their course to be as good as possible and decided that they could not afford for their course to be an experiment in every regard and to everybody involved. Thus they got help from their contacts abroad to get the help they needed from an experienced MOOC lab studio at a university in the U.S. For the supporting unit this represented a lost opportunity to learn how to make a fully web based course, but on the other hand the academic got help from an experienced studio in a project that was filled with plenty of problems and experimentation on all other fronts.

### Innovation as intrinsic value

A prevalent motivation for making the Norwegian massive open online courses was the aspect of innovating for innovation's own sake. This corroborates the findings Hollands and Tirthali (2014) got in the United States where they found that innovation in teaching and learning for its own sake was an important motivation for developing MOOCs. Allowing the people involved to learn new things and to experiment to find new ways of conceiving of what a course is supposed to be was seen as an important value.

Pretty much all of the interviewees in this Norwegian case said that the fact that MOOCs represents new possibilities was an important aspect of why they wanted to engage with the project. Many thought that using internet-enabled formats more actively in education is a trend that will grow stronger over time, and that experimenting with MOOC at this stage was a way of gaining experience and insights that would serve them and their students well in the future. Some interviewees had general ideas about this perceived trend, e.g. they observed that the internet had brought big changes to other industries and that it will probably allow higher education to do things in novel ways. Other had more specific ideas about the change to come, e.g. specifically how teaching and organisation of higher education might change in

the years to come. Some believed that we are at the cusp of a revolution where education will go from relaying content to learning through participation and active experience, and they saw MOOCs and the current functions they exhibit as a hint of what is to come.

In this study, participants often expressed a sense that the course format they were experimenting with was partly a way to experiment with new functionality and to do something new simply to see what happened. Through their insights into development in higher education and technology, many participants believed they could see that larger changes to how higher education operates are brimming on the horizon. Single MOOC courses were not perceived as game changers in themselves, but many participants certainly saw themselves as among the first to catch up on a growing trend of digitization in higher education which will leave the sector changed. They saw individual MOOC courses as part of a larger gradual paradigmatic shift brought about by making use of the internet and digital media.

Several interviewees expressed that the fact that they were creating their course was not just a way of “staying with the times”, but also a way to actively contribute to changing the education system. They often harbour some thoughts about things that are not working or express a sense of impatience about the rate at which academia adopts new concepts. The idea was that through their course they might show others that it is possible to do things differently from before and demonstrate that online learning (or MOOCs more specifically) had its merits. They often perceived a skepticism from their surroundings about these concepts and wanted their course to be a demonstration of what was possible, in order to transmute others’ skepticism into curiosity or even inspiration.

Interviewees believed that it is normatively important to try new things and to experiment, but they also find the process of trying something new to be personally enjoyable. They use words like “fun” and “interesting” when talking about why they wanted to create a MOOC and often describe themselves as people with a sense of curiosity.

*“Why I made this course? Well I guess that’s kind of like asking me “Why do you want to climb that mountain?” I don’t know what is at the top of that mountain, that’s what I am going there to find out.”*

## Potential for new paradigm

MOOCs do not seem to signify a significant shift in how higher Norwegian education institutions conceive of themselves and what they do. That is not to say that MOOC is a stable phenomenon which has shown its full potential. As of yet, MOOCs could be somewhat stuck in “web 1.0” style activity where the same learning that happens offline is simply moved online to a scalable format. The element of active participation has been exactly what so called “cMOOCs” have focused on, whereas the more common “xMOOCs” are lecture-based. xMOOCs may still evolve though, and it might be in a completely different direction than cMOOCs. Even if they should keep the one-directional approach of the course designer acting as a curator of knowledge, it is still possible they will make use of their learning data and platform in novel ways which have yet to be implemented.

### 5.1.5 Specific problems vs exploring value

During the analysis I have made an observation regarding the motivations behind courses that does not tie in with the four dimensions in the framework. Nevertheless, it is an interesting feature of the Norwegian MOOCs. It seems that the MOOCs in the case study grow out of two somewhat different visions at the idea stage: they have either been motivated by knowledge push or need pull. I found that while all course creators had an idea of why the course might be useful and about exploring the possibilities of a new format more generally, their *primary* motivations tended to skew one way or the other when it came to why they had decided to create the course: Some began with the realisation of a specific problem, and the MOOC was made with this problem in mind. They believed certain aspects of the MOOC format might be helpful at the local level with the added benefit that it provides added value that extends beyond their local problem. Other courses were made from a subtly different motivation, where the course was not seen as an answer to a direct problem but rather a way to explore the possibilities and to “take the next step” in leveraging digital technology for teaching in order to capture new value. These course creators have to some extent emulated the international MOOC format and attempted to “bring MOOC to Norway” as a way of achieving certain outcomes, but also as an experimental measure that can benefit the whole sector.

## 5.2 Visualisation of Norwegian MOOC as innovation

I have primarily presented and discussed findings at a cross-case level, using examples from individual cases. Many interviewees report on similar motivations but their perceptions range from modest to radical in terms of how innovative courses are. An example of this might be the motivation of providing flexibility, which could range from simply wanting to give campus students the opportunity to review material when it suited them, to allowing interaction between people from multiple nations across timezones. In order to give an impression of how the individual cases have been interpreted, I have mapped each individual case onto the typology I have been using:

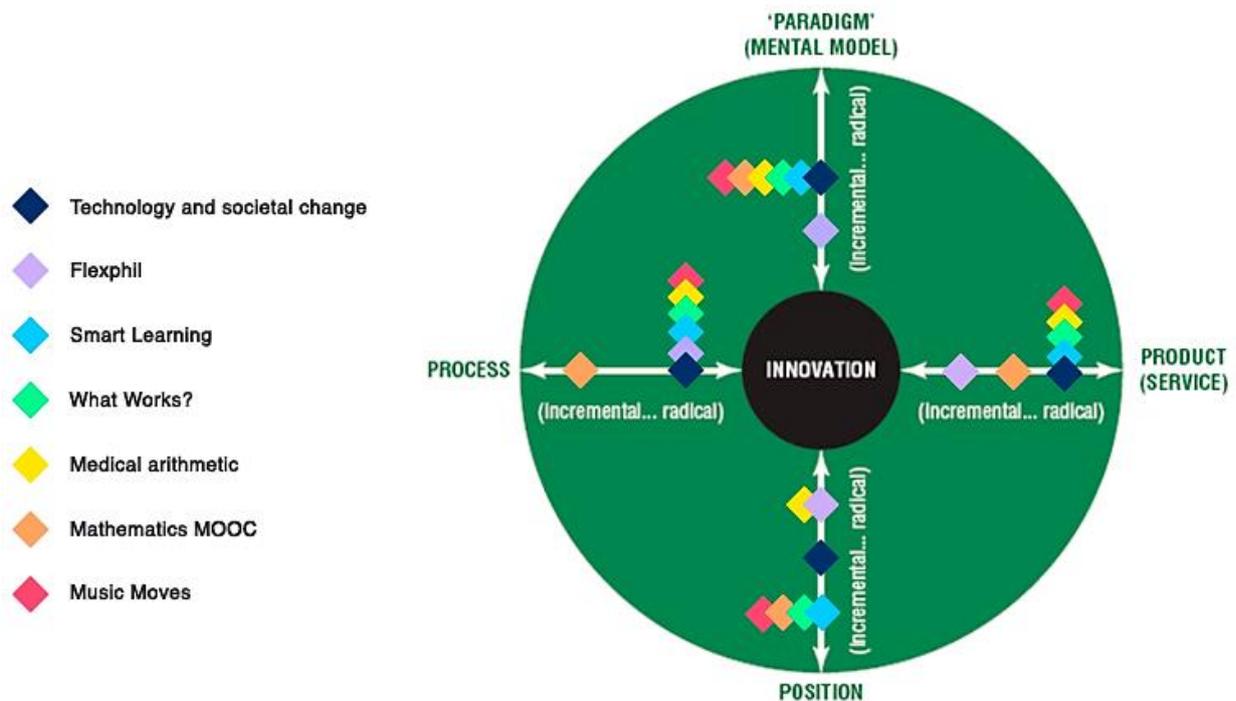


Figure 4. Cases mapped onto a model of the “4 P’s” typology of innovation by Francis & Bessant (2005).

The symbol for each course is placed along each of the dimensions in the framework in order to indicate the extent to which it is seen as innovative in each category. In the model, the arrows indicate that there is a range between incremental and radical in each domain. Note that placement close to the centre indicates perception as incremental innovation, while placement further out from the centre indicates perception as radical innovation.

The discussion has not considered how the courses in the study actually fit in the typology. The traits of courses and whether they are successful innovations has not been the focus of this discussion, but rather what the motivations for creating them can tell us conceptually about what kind of innovation MOOC is perceived as by the people involved in their development.

### 5.3 Summary of motivations and understanding of innovation

Norwegian massive online open courses were motivated by several factors, where some are similar to motivations reported for making MOOCs abroad. The most important motivations were to provide added functionality for learning, to expand access and to innovate and try something new. Courses often skew in one of two directions with regards to the specificity of the motivation for making them: Either they began as projects to address a specific problem or they were made to experiment with the potential of the format and explore a range of possible values.

Courses vary in how much new functionality they exhibit as a result of using the internet as the platform for the course. The motivation to create them for to leverage new features suggests that Norwegian MOOCs are conceived of as product innovation, ranging from incremental to radical depending on how much new functionality the course creators believed they were offering.

The MOOC format allows course providers to reach many people at a much lower cost than regular courses. Still, cutting costs was not a central motivation to Norwegian MOOCs, apart from the one course that was initiated by the authorities, and neither was collecting data from the courses in order to create an enhanced feedback mechanism. This suggests that Norwegian MOOCs are not primarily understood as process innovations.

While developing a university's brand was considered in two courses, it was not an important motivating factor. It seems MOOC was not motivated by ideas of the re-position within markets that characterizes incremental position innovation. Rather, many wanted to use the

format so they could open up completely new segments of students, suggesting that MOOC is seen as a quite radical position innovation.

An important reason why many courses were made was to try a new format simply to gain the experience and to experiment with how one might capture a latent potential of digital technology for learning. Many participants saw the course they had made as part of a larger trend of digitization of higher education, suggesting that MOOCs were aspects of a process of radical paradigmatic innovation.

This concludes the discussion on the first research question. I will now go on to relay and discuss findings for the second research question.



## 6 FINDINGS AND DISCUSSION - PART II

The findings for the two research questions in the thesis are discussed separately. In this chapter I present and discuss findings about the second research question: *What are the driving and limiting factors for development of Norwegian MOOCs as public innovation?* Based on analysis of interviews, news articles and funding applications connected to the courses in the study, I have found central driving and limiting factors for Norwegian massive online open courses. In this chapter I discuss these findings in light of central factors from Koch and Windrum's (2008) research on public innovation.

### 6.1 Driving and limiting factors to creation of Norwegian MOOCs

The aim of this thesis is to find out why Norwegian massive online open courses were made. While the previous section discussed the explicit motivations for creating the courses, this chapter will consider the second research question of which contextual factors that have driven and limited the development of the courses.

Part of the relevance of the questions asked in this thesis has to do with the fact that the Norwegian education system seems to lack some of the competitive traits and the unfilled space for free education which is often mentioned to explain the rise of MOOCs in other countries, especially the United States. The Norwegian higher education system is largely made up of public institutions that are free to attend. To get a better understanding of the factors that have driven or limited the development of courses, it is therefore relevant to discuss findings in light of previous research that deals specifically with public innovation. To facilitate the discussion, the findings will be presented in a structure based on factors which Norwegian researchers have found to be important to public innovation.

As outlined in the theory chapter, Windrum and Koch (2008) identify six common factors that determine when and how innovation occurs and whether it is successful:

- Public sector entrepreneurs
- Incentive structures
- Bottom-up innovation
- Top-down innovation
- Impact of New Public Management on innovation
- Implications of consumerism

These factors will provide the framework for the following presentation and discussion of findings.

Koch & Windrum note that public sector innovation is uniquely problem driven, either responding to underlying pressures in society or more local and specific problems. Certainly, this is true of Norwegian MOOCs: As outlined earlier, several of them were made in order to help with a specific local problem. The ones which weren't were still responding to aggregate drivers such as an increasingly information-rich and digital society.

### 6.1.1 Public entrepreneurs

Koch and Windrum (2008) reference Schumpeter's (1934) classic description of the entrepreneur as a driving force that initiates development of a novel innovation. Such people were central to all cases Koch and Windrum studied, and they describe them as creative people who want to challenge the status quo.

This finding is congruent with my finding that individual people and their motivation and resources is an important driver in all courses included in this study. Close to all the courses were the result of personal initiatives. In every instance, the *idea* behind a course has come from specific people in the higher education system wanting to see an idea realized (as opposed to, for instance, responding to an announcement calling for new initiatives in teaching). Still, although they have received support (which will be covered in more detail in the following sections), their *will to keep the project going* to and to invest their time and energy is the most important explanation for why there are MOOCs in Norway.

The people who have made Norwegian MOOCs were all enthusiastic about the project and took part in the project because of their professional enthusiasm over the value they hoped to achieve or the fact that they were testing a new and interesting idea that they wanted to see through to realization. Curiosity, enthusiasm and persistence were common traits among the people who developed Norwegian MOOCs. They were highly motivated for the project and

relished the opportunity to work on something experimental. One interviewee said they believed one has to have a “special kind of personality to get involved in these things”, and that it was not for everyone.

Windrum and Koch (2008) found that an important trait of the public entrepreneur is determination and maintaining the belief in the innovation despite setbacks, which was precisely one of the personal qualities that I found to be an important driver for the realization of the Norwegian MOOC projects. All interviewees describe the process of creating a MOOC as more challenging and time consuming than they previously thought it would be, and many came up against problems they had not anticipated. Being intrinsically motivated kept participants going despite these problems and to persist when they came up against challenges.

Further, Koch & Windrum (2008) describe entrepreneurs as well connected and able to draw on social and financial resources necessary for carrying out innovation by themselves. It does appear that the people behind these courses share some traits in terms of their position within the university system: One factor is that they appear rather well connected, having worked in different institutions or being involved in multidisciplinary work. Being able to draw on this network of contacts may have given them easier access to help or resources than what others might have had. By virtue of repeatedly having taken an interest in doing new things, they have sometimes gained a *reputation* for being someone who takes an interest in new things, which may have influenced the reactions and support they later got for the new initiative of being involved in a MOOC. Also, some interviewees were in a position where they had relative autonomy by virtue of being a leader in their unit or through having a very good understanding of how to secure the support or resources needed for the course. This gave them a little more freedom to make decisions about the course than if they had had less resources and needed to spend more time justifying their choices.

All interviewees bar one described themselves as someone who had an above average interest in and understanding of technology in general or as relating to teaching. That is not to say that they were specialists who had the technical understanding to create all digital materials by themselves, and they usually did not. However, as mentioned in the section about motivations, the interviewees considered themselves to be curious about new things and interested in learning their workings. Their general technical understanding made them able to

solve problems that arose or figure out how to do things they had not necessarily done before. These problem-solving skills meant that they were in a position where they were able to work out solutions and that the prospect of doing something new involving technology was an exciting challenge rather than an insurmountable one. As we will see later, many faculty members worked jointly with people from support units that were mandated to help faculty members to make use of digital technology and medium-specific methods in their teaching.

Given the findings outlined so far, it seems that the creators of Norwegian MOOCs fit quite well into the “superdig profile” that The Norwegian Agency for Digital Learning in Higher Education (NADLHE) found among Norwegian faculty members in 2014 (NUV, 2015). These were characterized by consistently positive regard of digital learning technologies and their potential. NUV found that these opinions correlated with how often respondents used such technology. The people interviewed for this case study gave the impression that they were perhaps somewhat atypical compared to other faculty members when it came to interest in technology and willingness to try new things. Findings from NADLHE support this claim, that there is indeed a subset of faculty members that are characterized by a significantly higher interest in digital learning technology compared to their peers. The existence of such a group has also been confirmed in other studies. For instance, Fossland (2015) uses the term «digital innovators» to describe a subset of faculty members which take an innovative approach to flexible education by using digital technology to develop their teaching style.

The finding that MOOC creators in Norway are well connected, digitally savvy and often had a very high degree of personal motivation which made them very persistent could indicate two things with regard to MOOCs in Norway: Either, the concept is so new that only those with a personal interest and “superdig” profile have cared to experiment with it, or there are limiting factors at play that lead to only the highly motivated, connected and technically literate being able to navigate such a project to completion.

### Supporting units as entrepreneurial actors

All the courses in this case study save for one was made with support from an expert organisation or a body within a university that could offer technical support and project management. These were groups that had their own stable funding and whose mandate is to support the integration of digital tools in teaching activities. For simplicity’s sake we shall

refer to these groups as “supporting ICT bodies” or “supporting units”. They have played a critical role in the development of Norwegian MOOCs through sparking initiative for courses and providing development support. The people in support functions themselves sometimes fit the role of the public entrepreneur, as some of them directly attempted to initiate online learning projects and inspire faculty members to become excited about potential projects.

The supporting ICT bodies often played an important part in the *origin* of the courses as well as in its implementation. In fact, many of the courses in this case study may not have come about if it had not been for the initiative of the ICT bodies. This is because the idea for courses often came as a result of these units informally suggesting the possibility of MOOC to the faculty members who would later become their collaborators, or to their leaders. They did this because they had been tasked with a mandate to further the use of ICT at their institution or in a specific field, and the nature of this mandate led to them being up to date about the possibilities of ICT-enhanced education.

Official recountings such as news articles about the course often emit the role that the ICT units played in sparking the idea for a course by engaging with faculty. The academic scene tends to be skeptical towards administrative functions taking such initiative, but the ICT bodies saw it as part of their mandate to ensure that faculty members and other relevant players were made aware of possibilities in case they were interested. It made sense to them that rather than to wait passively for the rest of the system to become aware of the concept and request assistance, they should make faculty members aware of opportunities which they might appreciate. One person from a supporting unit pointed out that when their unit was created, pretty much all their activity consisted of trying to create demand for their service by encouraging faculty to make more use of digital learning as a medium:

*“When our unit was established, the first years were almost exclusively spent on ‘missionary work’ and being out there to motivate people to get something started. We are an administrative unit so it isn’t really our place to get these things going. But nothing would have happened if we were going to wait for the academic units to get up to this by themselves. So to the degree that we’ve seen development with [digital learning tools] it’s been as we have been out there, doing the ‘missionary work’.”*

The faculty members who heard the pitch for creating a web based course were mostly enthusiastic. One was skeptical but curious, and became excited about the project after talking

to a person from the ICT unit and hearing them make the case for why an online course could be a good idea for their field.

Windrum & Koch (2008) propose that it is important that public entrepreneurs are well connected because no single individual will have all the competencies to carry out an innovation on their own. The presence of supporting bodies who are actually obligated by mandate to help in innovative efforts often makes it easier for academic entrepreneurs to develop their online courses.

### Continuation

While the motivation and persistence of the faculty members and support units was important to explain why courses were made, some are moving on from the course or the MOOC concept in general now that the project has been realized. Several faculty members are “leaving the project behind” in some way or another, for a combination of different reasons. Some made the course fully automated and are happy not to keep maintaining it further until it seems necessary. Others were interested precisely in being an active part of the course and to keep developing it, but find that maintaining the course will simply be unsustainable for them as it involves too much time. While supporting bodies could help the faculty members with creating courses, they are not in a position to be the ones who run or maintain the course and it is therefore up to the faculty members what to do further about the course once it has been created.

## 6.1.2 Incentive structures

Windrum & Koch (2008) identify incentive structures and support mechanisms that allocate financial and other resources to promote creativity as particularly important facilitators of innovation in the public sector. The findings presented regarding Norwegian MOOCs corroborate the importance of such resources and support. At the same time, course development is sometimes made more complicated by the existing incentive structure within which the faculty members behind Norwegian MOOCs find themselves.

While creators of Norwegian massive online open courses think there is value to be captured from courses, the central limiting factor to the projects has been that this value often exists

outside the incentive system that influences which activities that will receive resources and recognition in higher education. The criteria for how their work is evaluated are linked to standard goals to do with research and traditional teaching.

### Access to funding as a driving factor

All the Norwegian courses currently listed in the national MOOC directory come out of public universities, none of which have made large strategic investments in MOOCs or other formats the way we have seen in e.g. the U.S. Course creators have therefore been individually responsible for securing the resources needed to create courses.

Securing financial resources was done by way of applying to funding bodies. Some courses were financed through applying to a fund set up by the university, and one was financed by central authorities. The fact that supporting units that took care of project management and technical support were already funded was also important to the resource situation. Both the funding bodies and supporting ICT units are examples of the kind of support structures which Windrum and Koch (2008) identify as especially important to public sector innovation. A particularly important funding body was that of the Norwegian Agency for Digital Learning in Higher Education, which is set organised under the Ministry of Education and Research. This agency is tasked with making higher education more open. It funds projects and generates and shares knowledge in the field of lifelong, flexible and ICT supported learning.

Securing money has been central to making the courses, to the extent that it meant the difference between whether the courses were pursued at all. Many participants say that it would simply have been unfeasible to make the course if they hadn't had the extra money, which was used to free the time of the faculty members involved and to pay for licenses and production of course elements such as videos.

Even though many Norwegian MOOCs were made with technical support from a supporting digital learning unit, not all of these units had the expertise to master the technical aspects of making high quality learning materials. Therefore, funding was also sometimes necessary in order to create the digital content for the course. Some of the universities and platform providers in the U.S. and U.K. have channeled some of their investments into making recording and editing studios that specialize in this as well as the ICT aspects of course

creation. Norwegian course creators used parts of the funding they received either to travel and get help from one of these foreign studios, to buy the services from external providers in Norway or to buy equipment that allowed them to do their own recording and editing.

We have previously covered the explicit motivations behind creating MOOCs. Interestingly though, a few participants said that the fact that they knew they could get funding for the course was what triggered them to begin thinking about a potential project in the first place. These interviewees had been aware of the concept and its possible benefits for a while, and the fact that they could apply for money and the notion that they had the opportunity to create a MOOC was the factor that led them to think about the specifics of why they might want to do so.

#### Access to relevant expertise as a driving factor.

Another very important support mechanism for Norwegian massive online open courses was the development assistance that faculty members were able to get from supporting digital learning units or a course team. The help from supporting bodies was a central driving factor for Norwegian MOOCs, which is congruent with Windrum & Koch's findings that various forms of support mechanisms to aid creativity are important.

An interviewee from a support unit explained why they thought support units for digital learning were important if one wants to further innovation in digital methods in Norwegian higher education:

*“You can approach this as enthusiasts that simply go for it, despite not really having the requisite qualifications to make the best possible use of the technology. That they have this ‘innovator’s motive’. But if you’re going to get up to the systemic scale and raise the perceived quality [of online courses] then you are completely dependent on having a support team. (...) That’s probably the only way to do it to get past this sort of ad-hoc level of innovative work. It isn’t systematized, and if you want it to be systematized you need support.”*

All courses save for the first course that was released in 2013 were made with support from other units. Some had in-house support from a unit at the same university that dealt specifically with supporting ICT in pedagogy. One course was made with support from a foreign MOOC production office at a large American university, and another received

funding that allowed for setting up a designated project team in addition to receiving advice from a national office responsible for the integration of ICT in education. This office was also the supporting development partner of a course in this study.

As one of the people from an in-house ICT body pointed out, creating a MOOC entails that an academic is to create a course in a completely untraditional setting. The faculty members behind the course had help with creating and editing material that went into the course such as video content, games and technical aspects of the course design within the web platform, which was usually managed by the support unit. In addition to the technical help, supporting bodies often provided a project management function. They kept the production of material on track and brain-stormed with the faculty members about how to best design aspects of the course. One interviewee from a digital learning support function explains that they think many leaders seem to believe that faculty will be able to build digital solutions by themselves, but the interviewee sees this as unfeasible:

*“Then you will only have sporadic initiatives. Of course [faculty] can come up with interesting solutions, but these things are so complex. It’s almost doing the faculty a disservice to expect them to work out everything on their own. It would be so much better if it was enough that they are experts in their field, and we can do the tinkering. We can focus on that. Just converting your subject to a digital medium is a whole job of its own for them, it’s challenging enough if you want to do it properly. If on top of that they are expected to work out the technical and audiovisual stuff then that’s a lot. I mean it’s a full scale multi-medial production.”*

Some of the faculty members involved knew enough about coding and digital media to be able to put together large parts of a course on their own, but the fact that they ended up doing so much by themselves was mostly due to their local support body not having the skills to help with what they wanted done. This illustrates that while supporting ICT bodies were important to many courses, not all institutions have such support units. If they do, they still may not have the relevant technical or pedagogical expertise that is needed to help faculty with digital learning practices. Nationally, many faculty members report that they are missing support functions with relevant expertise in regards to developing new educational practices (NADLHE, 2015).

## The role of institutional incentives

Windrum & Koch (2008) highlights that public sector innovation tends to be problem driven, as it constantly faces a demand for better service within the same level of resource expenditure. This means that universities and other public institutions, unable to generate direct income, have an incentive to invest their resources in such a way that they can be relatively certain that they will get the most value from them.

Research in Windrum & Koch (2008) raises the issues of conflict between public entrepreneurship on a political scale and service-level scale. Their case studies indicate that service innovation on the political scale often is about efficiency gains through organizational structures, while service level entrepreneurs are more concerned with improving the quality of service, and efficiency gains is something they might take into account. This is supported by the finding that the faculty and people from supporting ICT units who were interviewed in this study were not primarily motivated by efficiency gains. However, in the one course that was initiated by the authorities, efficiency gains was precisely the reason why the course was a valuable solution to their problem.

Additionally, Windrum and Koch (2008) see an agency issue in public innovation: that politicians set “targets” that help them to control the activities further down in the hierarchy, tasking the service level employees with following these. In this case this would be faculty and administrative staff making decisions on behalf of their institution, which again makes decisions on behalf of the Ministry of Higher Education. Such “targets” play an important role in the incentive structure of Norwegian higher education: About 40% of the funding that higher education institutions receive from the authorities is based on how well they do on research and education targets.

This is why it was so important to course developers that they ensured the financial support to pay for the time of faculty members: with one exception, the faculty members involved had to fill their time with activities that were specified by their university. Specifically, they had quotas for teaching time and research time and their research output was a central part of how their performance was measured. This meant that the development of a MOOC was an extraordinary project which wasn't necessarily covered by the instructions faculty were acting under. This is supported by the ICT Monitor report for Norway from 2014, which shows that

institutions do not incentivize employees to undertake pedagogical and/or technological development projects (NADLHE, 2015). MOOC development can require rather a lot of extraordinary time to develop course materials, and this time isn't recognized within the formal system that measures the performance of an institution and its faculty members. Money was therefore important to redeem the time of faculty for a project that was considered to be outside of their normal function.

While a few faculty members worked on the project in their own time or reported it within their regular duties as either research and development time or teaching time (with a liberal understanding), most were reliant on the extraordinary project funding in order to be able to make the course. The faculty involved in the one course that did *not* require extra funding had their leader's support in registering their time of course development under "research and development". They did, however, use a learning resource in the course that they had developed some time earlier. For this, they had received funding to buy the time for the required technical development.

While faculty could not necessarily develop massive online open courses within their regular duties, the people from supporting digital learning units were well aligned with their incentives when they spent time on the projects, in that such work is in line with their mandate and the metrics along which they are measured.

As relatively expensive in the short term, MOOCs are competing for resources in a system that doesn't have extra resources to allocate unless they are taken from someplace else. For this to be justified, channeling resources into a project should either help solve a problem or influence indicators that will ensure more new future resources. The Babson annual survey of 2014 shows that half of university administrators in the U.S. think MOOCs are financially unsustainable, and that this number is a doubling since the last survey. So long as work on MOOCs is not supported by authorities and benefits appear indirect, it is unlikely that such courses appear any more financially viable to Norwegian institutions. Although the financial health of Norwegian public universities are not as directly influenced by market position, they need their initiatives to be financially viable either in their own right or through making sure they trigger support from the authorities. Because the potential output from a MOOC such as spreading knowledge outside the university and learning from experimentation do not directly

impact the metrics that influence resource flow into a university, the time spent on such activity is less likely to be requested and rewarded.

### Continuation, and integration

When discussing the importance of incentive structures as factors that explain why innovation happens, Koch & Windrum (2013) find that it is especially important that in addition to having ways of supporting creativity (financially and otherwise), there be structures to promote, stimulate and disseminate innovations. This is perhaps a dimension that is lacking in the Norwegian context of MOOCs: that once a course is made, there are no structures in place to “pick it up” and ensure its continuation.

While creation is one matter, some factors may make it difficult to integrate or to continue the course. Having national funding bodies that allow course creators to secure access to financial resources was important to the creation of Norwegian MOOCs (and even directly fuelled the idea to start a few of them!), but while it was possible to get support to *make* courses, not all of the courses had funding for continued development. Considering that the time spent on MOOC in many cases is “invisible” in the university incentive structure, this is an important reason why it is difficult for some course creators to be able to invest further time in the project.

### Policy makers

So far we have seen that the incentive structure in higher education might to some extent have made creation of massive open online courses more difficult. Several interviewees point out that the incentive structure under which institutions operate is given by the authorities, and that it is the decisions made at this level that can truly impact how easy or hard it is to make courses in different formats.

Seeing as the Norwegian higher education system is largely public, policy makers play an important part in managing change. Interviewees believed Norwegian policy makers and institutions are waiting to see what happens with regards to MOOC and how others who are experimenting with it fare. One noted that it does not appear to them that there is political will to do much about new teaching methods other than letting it emerge within the existing

system. In keeping with the tradition of free research institutions, decisions are left to the individual institutions.

A limiting factor for development of MOOCs in Norway has been that there seems to be relatively little focus on digital learning or new course formats in higher education at the policy level. Therefore, MOOCs often had to be made within the same incentive structure as regular campus courses.

The government did however order an official report on MOOC. The committee behind the report chose to report not only on MOOC, but rather on the landscape of digital learning of which MOOC is part. The report proposed a national infrastructure for digital learning and made several recommendations. So far, the only recommendation that has been followed was to establish a national centre for learning analysis. Some interviewees express a sense of impatience about this, with one noting:

*“We could have a national push to actually facilitate creation of infrastructure to leverage a big change. Or we can let everyone sit around by themselves and re-invent the wheel over and over.”*

Some of the interviewees who were most concerned about the future potential of MOOCs and related concepts expressed to the effect that they saw Norwegian higher education as somewhat complacent about the potential in digital learning. They noted that at some point we might start questioning public expenditure on higher education and believed that policy makers and institutional leadership would take a more active position on digital learning when this happened:

*“Change in attitude toward digital learning will require a crisis or a wonder. And I think a crisis is more likely than a wonder.”*

### 6.1.3 Top-down and bottom-up innovation

Koch & Windrum’s (2008) work on public innovation finds that public entrepreneurs can be situated at different hierarchical levels. They draw a distinction between top-down and bottom-up innovation. All the projects in this thesis save for one were initiated by public employees, suggesting that the emergence of Norwegian MOOCs can mainly be characterized

as driven by bottom-up innovation. This corroborates findings from the Norwegian Agency for Digital Learning in Higher Education's research that found that the introduction and advancement of digital learning technologies is driven by the initiatives of faculty, and that the organisation and its leaders are not very active in furthering the use of such technology.

Although relatively less powerful, innovative potential of the service entrepreneurs may be higher than that of those higher up in the hierarchy, because employees at the service level are specialists with in-depth understanding of their field (Windrum & Koch, 2008). This is true of course creators behind Norwegian MOOCs in that they are professionals with experience in teaching, and perhaps more importantly, interest in digital learning. The people in the supporting units are entirely specialised in implementing digital tools for teaching. As such, they are in a position where it is possible for them to pick up on new things more quickly than might be the case for their managers and for policy makers.

The research in Windrum & Koch (2008) raises the issues of conflict between public entrepreneurship on a political scale and service-level scale. Their case studies indicate that service innovation on the political scale often is about efficiency gains through organizational structures, while service level entrepreneurs are more concerned with improving the quality of service, and efficiency gains is something they might take into account. This is supported by the finding that the faculty and people from supporting ICT units who were interviewed in this study were not primarily motivated by efficiency gains. However, in the one course that was initiated by the authorities, efficiency gains was precisely the reason why the course was a valuable solution to their problem.

### Innovating within a bureaucratic system

Norwegian course creators faced some challenges due to the fact that they were experimenting within a framework of rules and regulations that have been decided further up in the hierarchy. These rules were made with other activities in mind than the ones course creators were undertaking. In an article, a course creator gave an example:

*“We struggle a bit with recruiting participants. Partly because [the institution] isn't wired to work this way, at least not with these courses. Things take time. We had everything ready and submitted by October, but things weren't ready on [the institution's] part before close to Christmas. That left us very little time for outreach. The organisation is skilled at*

*regular courses, but it's challenging when it's supposed to make sense of courses that require a wholly different set of competencies, different partners and different ways of solving things."*

Adhering to these rules and regulations sometimes required a lot of extra waiting time and work, particularly because regulations were either intended to cover a different sort of process than what was being attempted or because course creators simply hadn't anticipated them. This was a problem both for courses that attempted to get formal accreditation and those who did not, but more so for the former. Still, creators of both accredited and non-accredited courses expressed varying degrees of frustration about dealing with bureaucratic work. One participant describes how it put a damper on their motivation:

*"Just working through all the practical matters took about a year. To be honest, I was really close, 10, 15, 20 times, to just saying "I don't want anything to do with this any more". The most frustrating thing about the MOOC was all that work you had to do in advance. Setting things up, managing contact with [others], trying to figure out how to get money, contact with the platform. (...) The content was the fun part, but the infrastructure..."*

While some participants wanted their project to be explorative and iterative, applications for funding could require lengthy explanations of precisely what the project would accomplish. Parts of the process could require a lot of reporting and be quite tedious. One of the participants that got funding from their university found the application process itself to require so much work that they probably wouldn't have applied if it hadn't been for the fact that they could re-use much of their application from when they applied to a different funding body.

### **Leadership support as a driving factor**

Koch and Windrum (2008) show that for their projects to be successful innovations, it is essential that service entrepreneurs manage to convince other strategic actors to support them. While innovation in online teaching might start at the bottom of the hierarchy, getting the support from higher levels was important to Norwegian MOOCs both in the development phase and especially with ensuring that the project is able to continue. Academia places a high focus on autonomy, and this represents both a driving force and a lost opportunity to Norwegian MOOCs when it comes to the role of leadership, where the ideal is for academic leaders to have a rather "hands off" approach compared to other sectors. On the one hand, this

autonomy ensured that enthusiasts were able to start projects as long as they could make them fit within the incentive structure of the institution and obtain the relevant permissions. They then had a large degree of control over the project. On the other hand, they are not owed any formal help in the form of resources or with integrating the course into the existing system.

There was a fair bit of variation in exactly how much encouragement and support course creators received from the leadership at their institution, both at faculty level and higher up. Some projects faced some skepticism within their department, faculty or the like, with colleagues displaying what one interviewee referred to as the “not invented here”-attitude, where they saw a MOOC as either irrelevant or as a threat. Still, none of the projects faced any sort of active discouragement. Rather, they were often encouraged. However, one interviewee notes that while verbal encouragement is nice, the test of whether leaders actually think the project is important is whether they try to help it succeed through allocating resources or leveraging their networks to be of help.

Whether leaders chose to actively support the course and make it a common project was significant to how well the course was integrated into the existing framework of the institution. While courses could *technically* be created without leadership support, such support was also useful in that it provided legitimacy for time spent on the course and sometimes meant that the course was able to get access to some extra funding. However, several people interviewed pointed out that the level of support could vary between ranks, i.e. the rectorate might be very supportive whereas an immediate leader might be less invested. In such cases, it is limited what higher leadership can legitimately do to support the project other than to speak favourably of it, no matter how great they think they may think it is that someone is experimenting with new formats.

It is still rather unclear to several interviewees how their MOOCs fit into the host universities’ and their faculties’ strategies. Some perceive that their course is viewed as a sort of trial project at the mercy of the university which they may or may not take more active ownership of and thus ensure that it receives the resources necessary to keep developing it. However, in a case where the course was requested by the government and the leaders at the institutions were the ones who decided to take on the project, the course seems to have become integrated into their strategy and ensured a future spanning at least 5 years.

#### 6.1.4 The role of New Public Management (NPM)

Koch & Windrum also find that influence of new public management is an important factor in shaping the direction of innovation in the public sector through introducing a strong focus on cost efficiency and customer satisfaction. NPM has inspired changes where individual public organisations are tasked with meeting certain performance targets and state monies are transferred within this performance based reward system. As illustrated by the earlier discussion, this does correctly describe the incentive structure in Norwegian higher education, suggesting influence from New Public Management. Norwegian higher education institutions operate under a high degree of autonomy compared to other sectors, and so controlling resource flow is the authorities' main way to manage the sector apart from legislature.

The focus of this investigation has been one the level of course creators, and while they recount their perceptions of the system in which they find themselves, it is beyond the scope of this investigation to be able to say how New Public Management has influenced the Norwegian higher education system, based on the collected data.

#### 6.1.5 Effect of consumerisation

Koch and Windrum (2008) find that there is a trend in the public sector where rules and regulations on services are replaced with market-type controls which are based on the satisfaction that citizens have with services. In this process, citizens are re-conceived of as consumers of services. This development does not seem to have been very strong in Norwegian higher education with regards to teaching, which is still managed through regulations rather than student satisfaction measures.

Then again, it does not seem that students have voiced much preference in regards to their studies. Interviewees in this study tend to believe that students will demand more digital learning methods from public universities in the future, but they have played a very little role in the development so far and have not been the drivers for current massive online open courses that exist in Norway. One interviewee noted that while students may rebel and

demand new forms of teaching, they seem more concerned with living up to the standards in the subject than with questioning the subject itself.

Some point out that the new learning concepts are mostly known to a niche and that in order to demand alternatives, students would need to know what those alternatives are.

*“You have to know what you want to be able to ask for it, though. It’s like walking into a restaurant with no menu, you know you’re in the mood to eat something nice but what are you going to ask for if you don’t know what they have?”*

It seems that to the extent that interviewees have noticed demands from students, this has been for simple digital learning solutions that enhance the flexibility aspect of their education, such as recording lectures and putting them online. This supports the finding from 2012 that European students tend to approach learning technology mostly for convenience purposes (OECD, 2012). One interviewee pointed out that students only demand the kind of changes to course formats that they have already learnt about through exposure, and speculate that demand for new course formats will be quite different in 5 years, when more students have been exposed to new course formats that they encounter online.

If students are the market for online courses and are not requesting any changes to the current education model at this point, this suggests that there is little market pull for MOOCs in a more general sense as “a new way of learning” or an “alternative”, although courses aiming to solve specific problems have done rather well in attracting students. Still, respondents point out that students need to know that the alternative exists or to at least be able to envision “something different” in order to subsequently demand it. This is consistent with remarks Koch & Windrum makes in regards to the consumerist aspect of public innovation: If students are indeed seen as consumers of courses and expected to make their own choices about which courses to attend, they require knowledge of their options (Koch & Windrum, 2103).

## 6.2 Summary on public innovation and Norwegian MOOCs

In this section I sought to explore what the driving and limiting factors to development of Norwegian massive online open courses have been, and to use Windrum and Koch’s (2008)

research on public innovation to provide a theoretical framework to facilitate recounting and discussion of findings.

First, I argued that the personal motivation and resources of people behind the courses were important drivers, and that these people exhibit the traits of public entrepreneurs. Faculty members have not been the only ones to exhibit these traits and drive the project, people from supporting digital learning units have also taken on entrepreneurial roles.

Incentive structures have played a big part in the development of the courses. Financial resources are important drivers in development of courses, as is support from other units with relevant expertise and knowledge. The fact that MOOC projects require development time which is not recognized within current incentive structure is limiting. These incentives are set by institutions, who are again influenced by the incentives authorities have set for them. There is a national funding body set up by authorities to further ICT related projects in higher education, and being able to apply for funding here has been important to many of the courses in this study. However, the funding cannot support the maintenance of the course indefinitely and so the course must be integrated into the existing financial structure of the university. Authorities have not developed a systematic infrastructure that aids digitization in higher education and development of digital learning at higher education institutions in Norway is largely driven by individual initiatives.

The development of massive online open courses in Norway is largely a case of bottom-up innovation. An important driving factor for development of these courses is therefore whether they have support in the hierarchy, especially the support of leaders. Being somewhat further down in the hierarchy of Norwegian higher education, course creators must operate within some constraints and bureaucratic requirements that are set higher up in the hierarchy, and they sometimes see this as limiting.

Norwegian higher education has a high degree of democratic organisation, but the authorities manage the sector by setting performance targets for institutions and rewarding them for certain results, suggesting that Norwegian higher education is to some extent influenced by principles from new public management. However, students' satisfaction with teaching is not a main driver of management decisions in the sector, suggesting that there is little effect from consumerization trends in Norwegian higher education. While students have lately been more

vocal about their wish for more flexible access to content in their education, they have not been drivers of the development of massive open online courses in Norway.

This concludes the chapter on findings and discussion. In the next chapter I will conclude the thesis and make remarks on policy implications and considerations for future research on these topics.

# 7 CONCLUSION

With this thesis I have sought to apply theoretical concepts from innovation studies in order to find out how we might explain the development of MOOCs in Norway. This I have addressed through the following research questions:

1. *How are Norwegian MOOCs understood as innovations?*
2. *What are the driving and limiting factors for development of Norwegian MOOCs as public innovation?*

In this chapter I offer concluding remarks about the findings. I then present what I see as the limitations of the thesis. I discuss policy implications of the findings and conclude the thesis by offering my thoughts on possible directions for future research in the field.

## 7.1 Concluding remarks on findings

The basis for the first research question about how MOOC is understood as innovation was the observation that there appears to be a lack of consensus about the objective for creating MOOCs. I applied Francis and Bessant's (2005) framework on typologies of innovation in order to discuss how MOOC was understood as innovative. Courses could be innovative to a larger or lesser extent along all the four dimensions in the typology: product innovation, process innovation, position innovation and paradigm innovation.

I found that applying Francis and Bessant's (2005) typology was helpful to discuss the underlying objectives of MOOC creation. The typology allowed for discussion of how MOOCs are perceived to create new value as product, in process and positioning or as a change to the business paradigm, rather than simply discussing whether the concept is *new* or not. As such, the framework allowed for a more rigorous approach to discussing how these courses are perceived as innovative. The demarcations between the four dimensions in the framework are not always clear cut, but I believe this is a reflection of how the concepts are inherently related rather than a fault of the typology.

I have found that Norwegian MOOCs are primarily seen as product innovations and position innovations. Course creators generally wanted to create MOOCs to leverage the functionality of the internet to create novel services and to bring their teachings to whole new groups of people. Their level of ambition in this regard ranged from the incremental to the radical: while some simply wanted to put traditional learning material online to provide flexibility and access, others wanted to create wholly new digital learning experiences, open new markets or connect students with *each other* as well as with the material.

Norwegian MOOCs are not seen as process innovations to any large extent. It could be that this reflects the fact that service level employees largely have been the ones to spark and drive the development of the courses forward: The one case where a Norwegian MOOC was understood as a project innovation was instigated by the authorities. Creating a MOOC to improve processes could be less relevant for service level employees, while institutions and authorities are tasked with resource management in a way that service level employees are not

While individual course do not a paradigm shift make, Norwegian MOOCs and the concept in general are seen as part of a wider shift in higher education. To many, experimenting with using internet and digital technologies more actively in their teaching was a way to adapt to a new paradigm where they foresaw that higher education will be changed by adopting digital technologies, as has happened in other sectors.

With regards to the second research question, I wanted to find how the development of Norwegian MOOCs might be understood as public innovation. Discussion on the rise of MOOC abroad often ties their development to contextual drivers such as competition in the higher education sector. As most Norwegian MOOCs have been made within the public higher education system, I sought to discuss them in light of concepts that have been found to be particularly relevant in public innovation. To do this I have used the factors outlined in Koch & Windrum's (2008) research.

I found that it is highly relevant to look at Norwegian MOOCs as public innovation, as factors that have been found to be distinctly important in explaining public innovation contributed a great deal to the analysis. These factors tied in very well with prevalent themes in the data

material and help discuss drivers and limitations to Norwegian MOOCs in ways that a classical free market model of innovation processes may miss.

Driving factors behind Norwegian MOOCs are well explained by Koch and Windrum's (2008) concepts of bottom-up innovation and the public entrepreneur. MOOCs in this study have largely been bottom-up endeavours that have come about as the result of the efforts of resourceful and enthusiastic individuals. The personal resources of such entrepreneurs are significant drivers, and so is the support they receive in the form of funding, expert assistance and leadership support. The cases show that while a single public entrepreneur can be important in sparking the inception of a course, support in various forms is needed to drive the projects to completion.

Another important factor highlighted in Koch and Windrum's (2008) research is that of how incentive structures influence public innovation. The incentive structure in Norwegian higher education has been the most significant limiting factor to development of Norwegian MOOCs. Course creators faced several bureaucratic hurdles because the system in which they operate is built around traditional courses, and developing a massive open online course does not quite fit within this structure.

Koch and Windrum (2008) also point to influence of New Public Management (NPM) and consumerization as important factors to explain public innovation. I find that while there appears to be influence from NPM in the Norwegian higher education system, the material I have studied does not allow for a comprehensive discussion of this point. Consumerization does not appear to be an important driver behind Norwegian MOOCs as the higher education system appears to be governed through rules and regulations than by adapting to student behaviour.

## 7.2 Limitations of the thesis

I have attempted to include many cases in the study in the hope that this would provide some interesting convergence and contrasts within the themes that were developed. Still, the fact that so many courses are part of the multi-case does not make it a description of all

Norwegian MOOCs and I can only claim that my findings and conclusions hold for the courses that I studied.

Also, the study has only described a very narrow aspect of the innovative activity around these courses, namely the objective of innovation and what drove and limited the innovative projects. There are a lot of aspects to these courses that have come up in the research that might warrant a whole study of their own, for instance related to organisational learning, policy for innovation in higher education or leveraging the internet for new learning experiences. The list goes on.

While perhaps not a limitation to the study, it's important to note that the description offered in this analysis will not hold over time. I have attempted to describe something which is constantly developing and offer an insight into a short window in time. While some courses have been discontinued or have uncertain futures, some will continue to develop. One does well to keep in mind that although the history told of past thoughts, events and developments surrounding courses are unlikely to change much, the current and general descriptions of courses, their contexts and creators will probably not hold over time.

### 7.3 Implications for policy

The findings indicate that development of courses that make good use of the digital medium is an effort that exceeds what single faculty members can be expected to manage on their own. Making good use of the digital medium requires technological assistance and successful development requires financial support and legitimacy from leaders and institutions. While those who are enthusiastic about an idea may apply for funding from their institution or the Norwegian Agency for Digital Learning in Higher Education, such funding cannot do the job of integrating the project into the institutional context so long as the project exists "outside" structures that are geared towards traditional development and delivery of courses. Course creators exhibit motivations which appear to be in line with what institutions and authorities might want from experimental projects in higher education, such as a focus on enhanced flexibility and functionality in the learning experience, reaching more people with knowledge from universities and innovating to stay relevant in an increasingly digital society. If policy makers at the governmental or institutional level want a more systematic activity in the field

of experimental course formats, they would do well to ensure that all faculty have access to supporting expertise that can help with technical aspects and with how to make the most of the digital medium. Also, such projects should then have their own set of regulations and aligned incentives so as to avoid unnecessary hurdles that simply stem from the fact that existing rules do not recognize the existence of different course formats and the processes required to develop them.

Courses have mostly been instigated by faculty or those whose job it is to support faculty in implementation of ICT. These actors in the service spectrum of the hierarchy primarily understand MOOC as innovative in the domains of product, position and paradigm innovation. However, one of the cases in this study shows how a large online course might also be a process innovation that allows continuing education to be provided at lower cost than a seminar based model. Institutions or government have an interest in maintaining the competency of public employees while simultaneously using resources efficiently. There seems to be a possibility for these actors to use scalable online formats more actively for purposes of process innovation when it comes to continuing education. Keeping open versions of such courses could provide added value for people who might not be the target audience for the course but who might still nevertheless benefit from the knowledge.

## 7.4 Direction for future research

As I mentioned in the introduction in this thesis, the MOOC phenomenon is not well researched from an innovation perspective, and I believe there is a need for further qualitative study of MOOC or related contemporary phenomena. While I chose a multi-case analysis for this study in order to paint a broad picture, I believe there is a lot to be gained from doing a single case analysis into one of these courses in order to get a richer understanding of the process of creation, development and maintenance of a single MOOC.

Several people, supporting units or institutional leaders that were involved in the projects covered in this case study have been among the first to experiment with a massive and open online course format. In doing this they have gained experience with developing courses in a multidisciplinary and somewhat unprecedented context. It would be highly worthwhile to

look closer at the multidisciplinary and experiential learning that has taken place through projects and to see whether those involved are leveraging their experience in new projects.

Further, this study has highlighted the bottom-up nature of MOOC development in Norway. The fact that innovation in digital learning in Norway is highly driven by individual efforts has been confirmed several times (Fosslund, 2015, NADLHE, 2015). However, this study has also shown that policies have a significant influence on these projects. There is a long tradition in innovation studies for analysis of innovation policy, and I believe it would be highly valuable to conduct analyses that investigate the role policies have played for digital learning in Norway and abroad.

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# Appendix 1: Examples of MOOC interface

This appendix gives a few screenshot examples of the interface in a demonstration version of a MOOC. To get a better understanding of the interactive nature of a course, I recommend trying the the demonstration course “DemoX” at edX.org. Readers may access it at <http://tinyurl.com/EDXdemocourse>. For a shorter introduction I recommend the first video in the demonstration course, which may be accessed at <http://tinyurl.com/MOOCdemo>

MOOCs are often hosted on an online web platform. In this example, the platform is edx.org, one of the more popular platforms. It’s possible to search for courses from various institutions and to filter searches. The following image shows the top of the course list at edx.org.

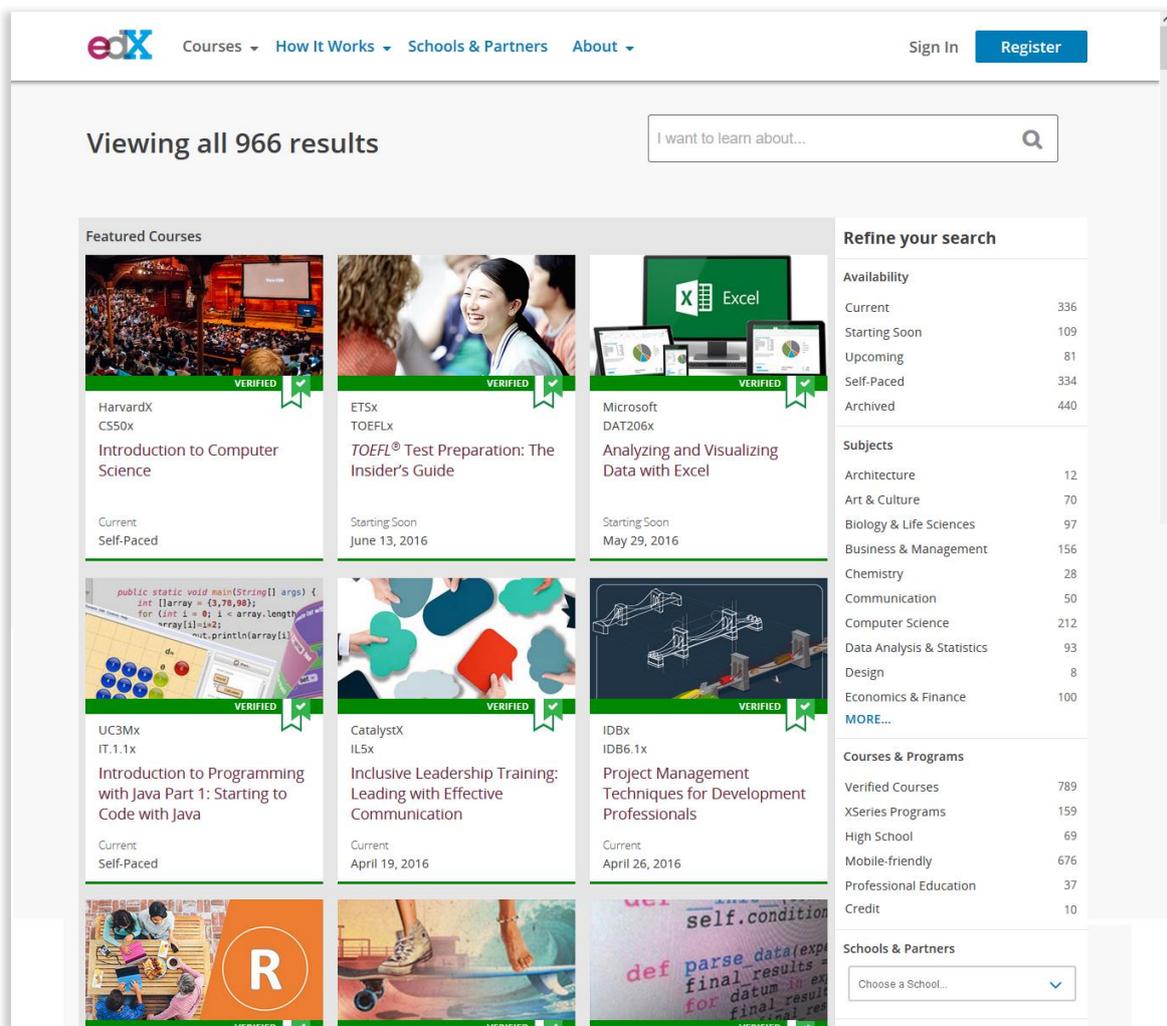


Figure A1: Screenshot from the course list at edx.org.

The following image shows the individual page of a course at edx.org.

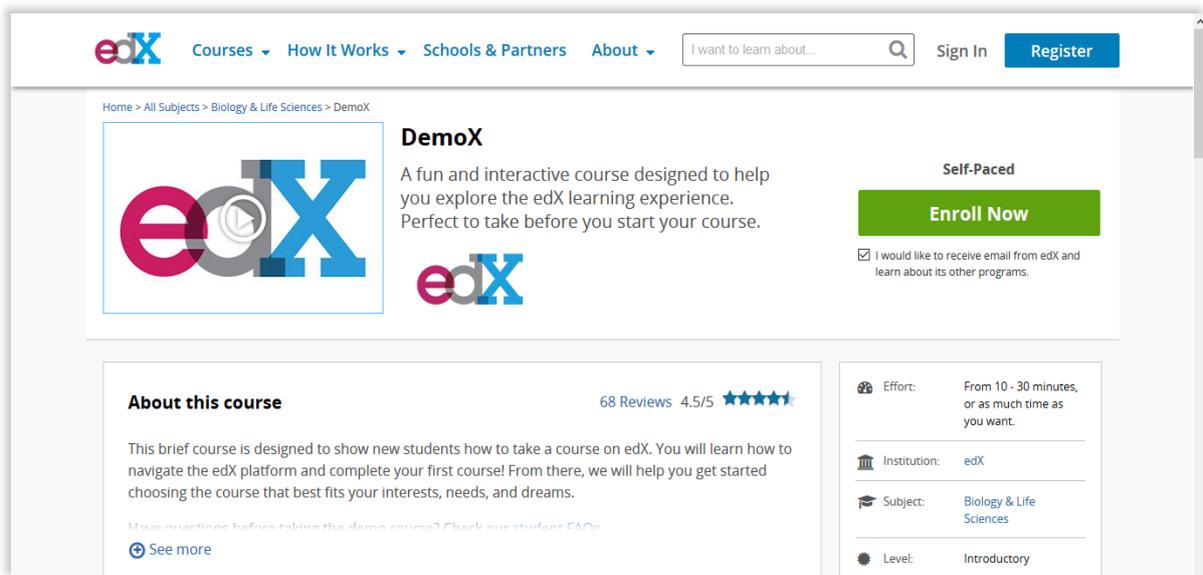


Figure A2: Screenshot from a course page at edx.org.

The next image shows what the course content page in the course interface looks like to students that have enrolled in the course.

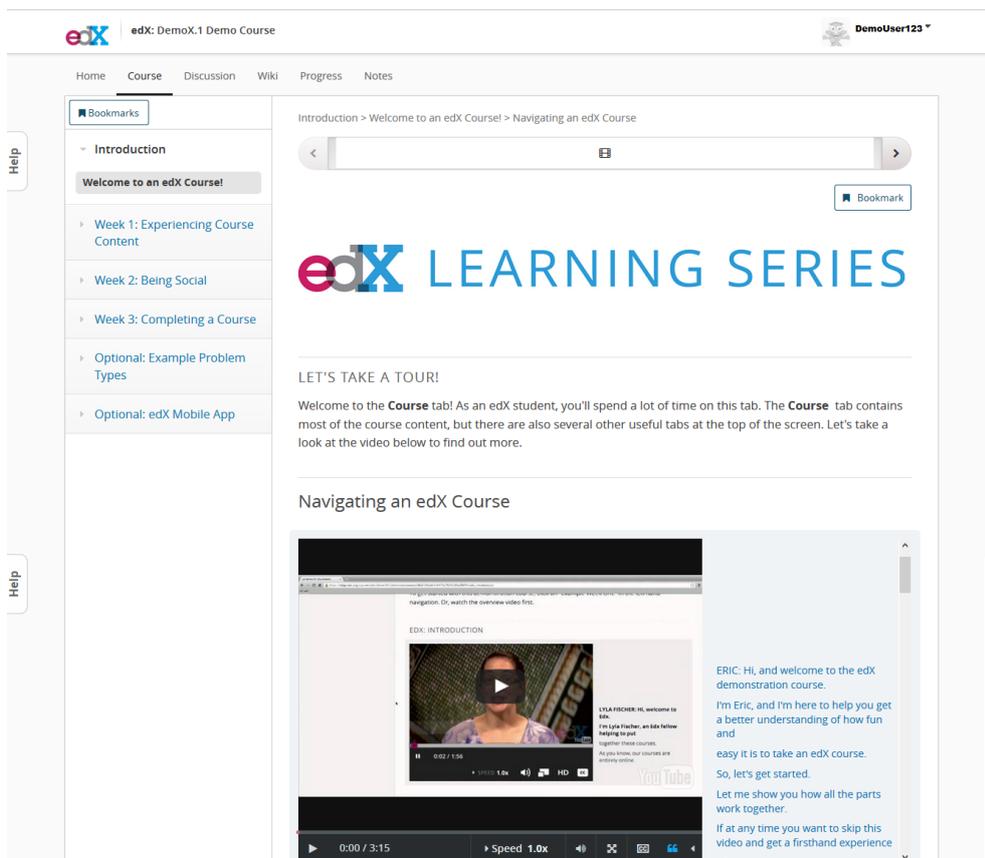


Figure A3: Screenshot of course interface at edx.org.

The following image shows an example of interactive learning resources that can be integrated into courses, in this case an interactive periodic table. Properties of different elements in the periodic table appear when an element in the table is clicked on.

The screenshot shows a web interface for an interactive learning resource. On the left is a navigation sidebar with a 'Bookmarks' section and a list of course content including 'Introduction', 'Week 1: Experiencing Course Content', 'Lesson 1: edX Content Basics', and subsequent weeks. The main content area is titled 'INTERACTIVE LEARNING TOOLS' and contains a paragraph explaining that some edX courses have interactive features. Below the text is a periodic table of elements. The element Titanium (Ti) is highlighted, and a pop-up window displays its properties:

|                                      |    |  |
|--------------------------------------|----|--|
| <b>Ti</b><br>Titanium<br>47.88 g/mol | 22 | Atomic Weight: 47.88 g/mol<br>Atomic Volume: 10.64 cm <sup>3</sup> /mol<br>Ionic Radius: 67 pm<br>Density: 4.5 g/cm <sup>3</sup><br>Melting Point: 1668 C<br>Boiling Point: 3287 C<br>Polarizability: 14.6<br>Electronegativity: 1.54<br>First Ionization Potential: 6.82 eV<br>Crystal Structure: Hex<br>Oxidation States: 3, 4<br>Electronic Configuration: [Ar]3d <sup>4</sup><br>Enthalpy of Fusion: 15,481 kJ/mol<br>Enthalpy of Vaporization: 429 kJ/mol<br>Covalent Radius: 1.32 Å<br>Thermal Conductivity: 0.219 W cm <sup>-1</sup> K <sup>-1</sup><br>Specific Heat Capacity: 0.523 J g <sup>-1</sup> K <sup>-1</sup><br>Enthalpy of Atomization: 468.61 kJ/mol |
|--------------------------------------|----|--|

The periodic table below shows elements from Hydrogen (H) to Oganesson (Og), with their atomic numbers and atomic weights displayed in each cell.

Figure A4: Screenshot showing an example of an interactive learning resource.

## Appendix 2: Information and consent form

*Anine Havn Andresens masteroppgave ved Senter for Teknologi, Innovasjon og Kultur ved UiO, 2016*

### Informasjons- og samtykkeskjema

#### Informasjon til deltakere i masteroppgaven:

- Oppgaven vil basere seg på intervjuer med personer som har vært tilknyttet norske MOOC-prosjekt, nyhetsartikler og rapporter om disse kursene, samt relevante rapporter, studier og analyser av MOOCs og online læring i og utenfor Norge.
- Det legges opp til å identifisere de individuelle kursene i studien med mindre deltaker ønsker at kurset skal anonymiseres.
- Deltakere vil ikke bli identifisert ved navn i oppgaven, men det er mulig å gjette seg frem til deres identitet gjennom deres rolle i identifiserte kurs. Deltakere har derfor mulighet til å presisere dersom de ønsker utsagn anonymisert, disse vil da presenteres uten å knyttes til et gitt kurs.
- I dokumenter som brukes i arbeidet med oppgaven vil deltakere refereres til som «deltaker A», «deltaker B» osv. Huskelisten som knytter disse til navn lagres på Anines passordbeskyttede lagringsområde på UiOs server. Denne vil ikke deles med andre, og vil bli slettet senest når oppgaven er levert.
- Intervjuer vil bli tatt opp med diktafon for å sikre rett gjengivelse av utsagn fra deltakere til den videre analysen. Lydfilene lagres på Anines passordbeskyttede lagringsområde på UiOs server. De vil ikke deles med andre, og vil bli slettet senest når oppgaven er levert.
- Deltakere kan når som helst trekke sitt bidrag til oppgaven frem til ferdigstilling 25. mai 2016.

#### Kontaktinformasjon:

*Veileder:*

Arne Martin Fevolden  
Forsker II/ Senior Researcher, UiO/NIFU  
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anine@student.sv.uio.no  
9019567

**Jeg er gjort kjent med ovenstående informasjon og samtykker til å delta i som informant til kasusstudien:**

---

Dato

Underskrift

## Appendix 3: Interview guide

Note that the interviews were conducted in Norwegian. This guide is a translation of the original guide.

### **Questions:**

Can you tell me a bit about your position and responsibilities?

What has been your role in [course]?

Did any others play significant parts in the course creation or development?

How did the idea to make the course first arise?

Why did you want to proceed with the idea?

(Prompts:

- Scale
- Transfer value to campus teaching
- Staying with the times
- Democratisation
- Making it cheaper to offer course (per student)
- Better learning experience
- Visibility of institution
- Showcase research
- Internationalization
- Coordination between institutions
- Relevance to industry )

Did you hope that making the course would help you learn something new?

Did you consider your course a “MOOC”?

What was it like to create a MOOC in Norway at that time?

How was the course integrated into the institute/institution?

Did you have support from colleagues/the institute/faculty/rectorate?

What resources did you have to draw on when developing the course?

Did you seek help or advice with aspects of the course?

Have you discovered any valuable aspects to making the course that you did not foresee?

Would you like to make any additional comments about these topics?