NORDIC JOURNAL OF
DIGITAL LITERACY

Nordic Journal of Digital Literacy (NJDL) is aimed at researchers, school authorities, school leaders in primary and secondary schools, teachers in primary and secondary education, at colleges and universities, and others concerned with education and ICT.

The journal contains peer-reviewed articles, conference papers, debates and commentaries, software and book reviews. Through dissemination of national and international research, the journal contributes to the debate on education policy. The journal aims at creating a platform for the critical analysis of digital literacy and competence, and the use of ICT in educational context. Moreover the aim is to stimulate dialogue between different participants in the field. Upon reception, the editor evaluates all submissions. After editor screening, approved contributions are sent to at least two anonymous international reviewers.

Nordic Journal of Digital Literacy has a focus on articles that deal thematically with digital literacy and the use of ICT in educational settings. Papers can among others be targeted on the following themes:

– ICT use and innovation in education
– Theoretical, methodological and practical challenges around the use of ICT in education
– ICT in subjects (didactic context)
– Evaluation and development
– Learners' work and learners' ICT skills
– Teachers, teacher education and classroom management
– Lifelong learning

Content

Guest editorial

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Online learning—understood as distance education delivered via the internet—is one of the fastest growing paths within education. We observe an increasing number of students enrolled in online learning study programs and courses, and in higher education institutions regular campus-based education are incorporating elements from online learning too. Several causes are driving the growing number of online students and the hybridization of campus-based education. One is the emergence of new groups of students i.e. adult learners who combine studies with work and who cannot attend campus-based education; another is existing student groups expecting a greater part of the study material to be digitalized and made available online. In addition, the recent wave of mergers in higher education institutions, both in the Nordic countries and in Europe, has created multi-campus institutions that need to draw on teaching resources at several locations (Bates, 2015; Gaebel et al., 2014).

While the reach and uptake of online learning in its various forms and formats – from conventional online courses to large scale open courses, such as Massive Online Open Courses (MOOCS) – are widespread and have a long history within higher education, a similar trend within K-12 education is newer. Barbour (2014) suggests that the emergence of K-12 distance online education derives partly from the evolution of correspondence education via various media, such as radio- and videoconferencing, to online solutions, and partly from governmental financial support of online programmes along with supplemental prospects and nationwide initiatives (Barbour, 2014).

However, whereas the evolution from correspondence education to K-12 online distance education programmes are confirmed in the U.S. and other countries worldwide, emerging K-12 distance online education has had other origins in the Nordic countries. In these countries K-12 distance online education is a rather new initiative that gained ground in educational contexts with the introduction of the internet, which enabled it to reach out to a broader audience across the Nordic countries.

While there are numerous studies on online and blended learning in higher education contexts (Allen & Seaman, 2015; Means, Toymana, Murphy, Bakia & Jones, 2010), less activity is reported both from the practice side and from the research community when it

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comes to K-12 online learning (Barbour, Archambault & DiPietro, 2013). However, there are several studies that address the spread and uptake of blended learning and in-class use of ICT for K-12 students, and the boundaries between these categories are not rigid. For example, what constitutes blended learning in some contexts may be considered online learning in others (Barbour, 2014; Bates, 2014).

The boundaries of what constitutes online learning are thus blurred. Nevertheless, one key distinction might be to define online learning as teaching and learning situations where the teacher and students are physically separated and the course is distributed via the internet (Allen & Seaman, 2017). Variations of online and blended learning, and how these types of distributions of teaching and learning influence pedagogics and learning, will be further elaborated in the contributions to this special issue.

This special issue thus highlights online learning in its various forms, spanning from distance based online learning for K-12 students to explorations of various MOOCs within higher education institutions.

In *Conventional classroom teaching through ICT and distance teach*ing, Øgaard introduces the readers to a case study from the outskirts of Greenland, the most remote area of the Nordic region. In Øgaard's paper, we learn that there has been a political focus on distance teaching as a relevant tool in the educational system. The actual case study derives from the most comprehensive example of distance teaching in schools in Greenland, and the author searches for answers to the question of how distance teaching can be utilized in schools, to what degree distance teaching can be labelled a progressive pedagogical development, and whether it supports the learning goals in the School Act. Throughout the analyses, he demonstrates clearly that distance teaching and advanced digital technology rather confirm traditional classroom teaching instead of enhancing new modes of teaching driven by technology. He concludes that, in this actual case, he did not recognize any connection between ICT-driven distance teaching in schools and pedagogical development. Consequently, he suggests that digital or media literacy does not emerge from distance teaching itself, or the use of technology; on the contrary, these kinds of competences derive from implicit and affiliated pedagogical decisions.

His conclusion addressing awareness of pedagogical development when adopting technology for teaching and learning is somehow echoed in the second paper in this special issue, *Digital professional development: towards a collaborative learning approach for taking higher education into the digitalized age*. In this paper, Langset, Jacobsen and Haugsbakken explore the potential of a model for professional digital competency development for teacher educators at a higher education institution in Norway. The researchers highlight that one key dimension of the model would be that it sustains the autonomy of the educator, and they present ideas for new practices and innovation. They go on to say that these goals are easier to obtain when rooted within the institutions, rather than in top-down initiatives, such as institutional strategies and policy documents. The actual model was distributed to teaching staff as a blended learning MOOC. In the paper, the researchers pose two questions: What components contributed to digital professional development (DPD) among the educators we follow in this study? How can we describe a productive digital professional developmental process at the meso-level in a higher education institution, such as a teacher-training unit? The researchers found that the actual model ena-

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bled the teacher educators to become digital role models for their students and provided them with new ideas regarding digital learning. Moreover, the researchers found the creation of a community of learners at the meso-level to be useful. Even if the study was a single case study, the researchers suggest that the findings might be transferable to other settings as long as the actual contextual factors are recognizable in those new settings.

The last paper in this special issue also addresses the potential that comes with large-scale online courses such as MOOCs. In this paper, entitled *An Analysis of Participants' Experiences from the First International MOOC Offered at the University of Oslo*, Singh and Mørch investigate the pedagogical practices in the MOOC and the experiences of the participants regarding teaching and learning practices. The MOOC in this paper varies in many ways from the MOOC presented in the paper by Langset and colleagues, which mainly addressed local teaching staff within one single higher education institution. The MOOC Singh and Mørch studied aimed to reach an international audience, which also meant that it was delivered in English. Second, the considerable number of students who signed up to the course addresses the issue of scaling, which is recognized as a key feature of MOOCs. Third, this MOOC was provided by a recognized MOOC platform, FutureLearn. Through a mixed-method study design, the researchers delve into the potential for learning that comes with this type of online course. A key finding was that, due to minimal teacher presence in the course, the students depended on each other to make progress, thus developing peer-led scaffolding activities. The researchers suggest that future MOOCs might benefit from the potential that comes with learning analytics in that it would enable better ways for teacher staff to follow the students' progress.

The three papers that comprise this special issue on online learning in the Nordic countries all address issues regarding the potential inherent in the field. Online learning allows for participation independent from location. As demonstrated in Ødegaard's paper, online learning enables young students to participate in schooling and education from remote areas in Greenland. The case in Singh and Mørch's paper opened up the course for participation for students from all over the world with access to the internet.

Another observation is that even though technology enhanced teaching and learning undoubtedly may boost pedagogical innovation, such a development does not happen without digitally competent teachers and faculty staff. Ødegaard demonstrates this clearly; in his case the teachers mainly continued their teacher-oriented type of instruction over the internet, none of them seeming to grasp the opportunity for pedagogical innovation. Pedagogical innovation through the use of technology is a key feature of the MOOC at NTNU, and the paper by Langset and colleagues demonstrates how various efforts will have to be made in order to succeed on these matters. The role of the teachers and their understanding of how to design online learning environments are also addressed in the last paper by Singh and Mørch in this special issue. The role of the teacher in various online environments are thus to be considered as a key feature, and it takes distinct skills and competences to succeed. Whereas teachers' competences for online teaching has been flagged in numerous studies and in the field of practitioners in countries that have a longer history of online learning, there seems to be less awareness of this in the Nordic countries, even if there are exceptions. This observation is also linked to the fact that the Nordic countries have moved in the direction of online learning at a slower pace than other parts

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of the world. Nevertheless, as this special issue has shown, online learning is gaining ground within these education systems and only the future will tell what potential it will provide to citizens of the Nordic countries.

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Conventional classroom teaching through ICT and distance teaching

A case study from Greenland

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ABSTRACT

Conditions for schooling in Greenland are challenging in many ways. The staff of teachers in the country is very heterogeneous: some have teacher training, but many are without, and often work with limited resources. Distance teaching could be a tool to share teaching resources and raise the quality of teaching in the many small isolated communities and settlements.

This paper presents a case study on distance teaching in a school in Greenland. Data from work on Grounded Theory is used to investigate ways of utilizing distance teaching in the school. The analysis draws on a prevalent perspective on distance teaching as providing access to education. The perspective combines with Michel Foucault's concept of "governmentality".

I will show how progressive possibilities are not necessarily to be found in ICT-driven distance teaching. Pedagogical drivers operate behind the choices of ICT equipment and ICT solutions which, in this case, brings ICT under the command of a less progressive pedagogical agenda.

As I will show, the commitment from the municipality and from the teachers was to use distance teaching and ICT for conventional schooling. The case lays the ground for a discussion on the progressivity of distance teaching and the use of advanced ICT solutions in schools. My aim with the paper is to add to the understanding of the scope of distance teaching in schools. Does ICT and distance teaching serve progressive ends per se? What do we learn about distance teaching from this setup in the school in Greenland?

Keywords

Distance teaching, e-learning, online, ICT, K-12, settlements, Greenland, Michel Foucault

INTRODUCTION

Late in the summer of 2010 the school, in a small settlement on the west coast of Greenland, invited the children to step into a converted classroom. From a widescreen TV, their new distance teacher welcomed them live from a school in Nuuk, the capital of Greenland. From this room, distance teaching was going to be the way they went to school. The children were very reluctant to step into the room, stopping at the doorway and looking in. This behavior was noticed by one of the male pupils. Unlike the other children, the boy comes from a family with some education and above average resources compared to others in the village. They were newcomers with a family connection to the place. The other children became less nervous when he stepped into the room and showed them that they didn't have to be frightened of the cameras and TV screen. Upon entering, a supply teacher noticed that the children were hiding underneath tables, or placed tables against the walls to get away from the cameras; he experienced that they were frightened of seeing themselves on the screen. The exposure from all the digital hardware was an extraordinary and uncomfortable experience for the children; only the boy thrived immediately in the new virtual school setting.

Greenland is in a process of postcolonial nation-building. Gradually, responsibilities are being transferred from Denmark to elected Greenlandic politicians. Education was transferred with the home rule referendum in 1979, and a new School Act was written and implemented by the Greenlandic government in 2002 (Inatsisartutlov 2012). Learning goals are now increasing pupils' responsibility and strengthening their collaboration, independent thinking, critical decision-making, engagement, and cooperation skills. The goals in the legislation are clearly associated with the process of emancipation.

There has long been a persistent political focus on distance teaching as a relevant tool in the educational system in Greenland (von Staffeldt 2001) (Naalakkersuisut 07.06.2017). The episode described above is taken from the most comprehensive and prominent example of distance teaching in the school system. This example is the subject for the case study in this paper, in the search for answers to the question of how distance teaching can be utilized in schools, and to what degree distance teaching can be labeled progressive pedagogical development and support the learning goals in the School Act.

Literature review: Lack of qualitative research on distance teaching in schools

One endeavor exclusive to distance teaching is providing access to education (Lee 2009, Slåtto 2012). This means giving opportunities to people living in remote areas or to adults who can not leave well-established lives to move to a city in order to engage in education. This perspective puts adult education or secondary education as a premise for most research on distance teaching.

Distance teaching in schools as a field of research is still a subject in the making. Michael K. Barbour from Sacred Heart University in Connecticut, USA, has written a number of reviews on distance teaching research (Barbour & Reeves 2009; Barbour 2013; Barbour, Archambault & DiPietro 2013; Barbour 2015). He is repeatedly brought to the conclusion that research in the field is sparse. There are many quantitative surveys to be found on the widespread use of distance teaching with school children ("Keeping Pace with K-12 Digital Learning" 2015; Boboc 2014). A dominant question in this work is to what

extent distance teaching can compare in terms of quality. However, qualitative investigations looking for unique learning processes connected to a distance between teachers and learners are sparse.

Another predominant endeavor with teaching at a distance is pedagogical development. Even before the use of the internet, distance education was predicted to be a potent driver in nations moving from an industrial society to a postmodern information society. In 1993, Otto Peters described how distance education would support personal development and lifelong learning (Peters 1993). By providing access to education while at the same time stimulating personal learning paths and self-management, distance education was expected to facilitate literacy comprising independence, self-reliance, flexibility and development. Following this progressive lead on distance education, distance teaching in schools has been viewed as a positive development and a form of advanced schooling for the future (European Commission 2008).

ICT in connection with education and teaching is expected to support development and progress. This is a widespread topic for research in the field (Prensky 2001, Kress 2003, Pietrass 2009, Erstad 2010). The technology is associated with a new a kind of literacy, coined "digital literacy" or "media literacy" (Erstad 2010). Often this progressive view of ICT in education transfers to a likewise progressive expectation on behalf of distance learning.

An important extension to the pedagogical debate since Peters's prediction is the recognition that collaboration is a central component of literacy and competency in an information society. Garrison (2000) outlines how theory regarding distance education has shifted focus from autonomy and independence to collaboration and transactions. Networking through digital media has become omnipresent (OECD 2012) which brings high expectations to the benefits of distance education (European Commission 2008). The expectancy is that students become engaged, communicating and collaborating through distance teaching (Beldarrain 2006). However, a defining part of this is a specific use of ICT in the distance teaching setup (for case studies on different implementations of ICT in schools, see Wong et al. 2008).

The field of research is dominated by high expectations for distance education to be a driver, in partnership with the use of ICT, for pedagogical development. But qualitative research on the use of distance teaching in schools is still in demand.

THEORETICAL BASIS

The data collection for the following case study was formed as Grounded Theory. Grounded Theory comprises a thorough method resulting in new theory on a subject matter. Data is given a leading role in this work to make the theory grounded in the field of study (Glaser & Strauss 2012 [1967]) The yield in terms of new concepts and new theory will not be presented in this paper. Data is analyzed to answer the question posed in the introduction (the extent of progressivity found in distance teaching in schools).

For my work with Grounded Theory, some framing was done to keep focus on distance teaching. Before I started data collection, I deliberately distinguished between ICT in school and distance teaching. Distance teaching has been practiced using analog media since before digital technology became widespread (Keegan 1986). Moreover, ICT in

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schools is not about distance teaching, but rather comprises a variety of agendas. When the topic is distance education, affordances connected to digital technology are often the real focus, not what the distance between teacher and learner provides in terms of learning or literacy.

The distinction between ICT and distance teaching is relevant because ICT and distance teaching might represent different endeavors. That said, the endeavors also collide, and support, and generate each other.

An important framing for the study has been to view ICT not as something defining distance teaching, but rather to see how technical choices and solutions contain and express pedagogical thoughts driving the realization of distance teaching practice. This has been supportive in getting beyond the assumptions on ICT as didactically progressive per se.

Another focus of my data collecting has been ways in which pupils and teachers have participated in relation to the roles offered by the distance teaching setup. The perspective draws on theory and research building on Michel Foucault's concept of power. Giving responsibility to pupils and pointing to their personal development can be viewed as sanctioning and disciplining in a postindustrial society, replacing the surveillance and physical obedience connected to schooling in the industrial society (Krejsler 2014, Krejsler 2004). Power in the classroom does not disappear with student involvement. It takes hold in students by guiding through roles and identities. Integration works by demanding involvement and responsibility. In this perspective, power forms processes of productivity, rather than of suppression and dominance (Foucault 1994). Foucault shows how this is a defining part of how modern western liberal democratic societies work. Through studies of principal institutions like prisons and hospitals, Foucault found an omnipresent and relentless endeavor from the state to integrate its citizens. With the term "governmentality," he captures how the state stretches to absorb and to optimize its citizens through distributed powers of definition (Foucault 2009. p. 108).

The social constructionist perspective stemming from the work of Foucault and others seems to contradict a premise with Grounded Theory: data is expected to inform the researcher's development of new concepts. Social constructionism understands this relationship the other way around: it is terms and concepts with the researcher that inform his or her comprehension of the field.

Grounded Theory was presented by Barney Glaser and Anselm Strauss in 1967 (Glaser & Strauss 1967). They wanted to advocate for researchers' creativity in coining new terms and concepts. Their method was a focus on the meeting between the researchers' established understandings and the workings in the field of study. They recommended utilizing active words and phrases from the field of study. In their perspective data does not "speak", but there is a meeting, and with a systematic approach Glaser and Strauss saw concepts and terms as valuable research results.

The two theoretical approaches I use are not related, but I do not see them as excluding one another. (For further discussion, see Thornberg 2012, or Øgaard 2015). Data from my work on Grounded Theory is relatively open ended, within the framing mentioned, and suitable for research on the quality of distance teaching in schools.

Summing up, the analysis in this paper draws on dominant concepts on distance teaching as access in conjunction with Foucault's concept of power and perspectives on "govern-

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mentality". A methodological focus has been how these relationships are reflected in the roles assigned to or taken up by pupils and teachers. Following this perspective, the question about distance teaching as progressive or conventional schooling relates to a critical discussion about what ends schools as institutions serve.

QUALITATIVE DATA FROM THE SCHOOL IN GREENLAND

The settlement where the distance teaching took place is situated 100 kilometers from Nuuk in the Nuuk Fjord. It is the only active settlement close to the capital. The village has around 70 inhabitants. Children of school age vary from two to eight. Data for this case study are sparse due to conditions for the study: very few people were involved in the distance teaching, which made the research short on interviewees to contact and chose from. Geography and infrastructure in Greenland makes flying and sailing necessary, which causes data collecting to be expensive, time consuming, and complicated. Further, I do not speak Greenlandic, which, in some cases, restricted the data collecting. However, these conditions are justified by the research being qualitative. A few interviews with different agents sufficed. Another quality which makes up for the conditions is that not much qualified research has been done on this subject (the most comprehensive report is von Staffeldt 2001). As a result of the difficult conditions for collecting data and the sparse material to choose from, I used a wide range of qualitative methods to get as much data as possible. This also triangulates the study. Data was collected from January 2012, a document being the oldest, until April 2015, when I made observations of teachers in Nuuk teaching pupils in the settlement.

Table 1. Data and method

Type of data	Quantity	Persons involved	Length	Comments
Focus group interview	1	3	1 hour	Heterogeneous group
Interview	1	1	30 min.	
Focus group interview	2	2	45 min.	Heterogeneous group
Document	1	1	30 pages	Report written in Danish
Observations	2	3	30 min.	Distance teaching
Edited video recording	1	5	14 min.	Edit included in analysis

Data were obtained from several open interviews. I had a focus group interview with two teachers still involved in the project at the time. The project manager from the municipality also took part in this interview. The informants represented different positions and responsibilities in the project. This shaped the data, as the premise became a positive take on the municipality's achievement. The conversation revolved around the purpose of the project and how they were moving towards their goals. The interview gave data on the practical solutions and the thoughts behind their decisions. In order to encourage more critical

opinions on the distance teaching, the focus group should have been with a more homogeneous group of people. Leaving out project managers and other authorities and representatives would have given the teachers more freedom to elaborate on critical views, which for that reason is a disadvantage of this focus group interview.

One interview with a former inhabitant from the settlement who took part as a supply teacher adds to data on practical solutions, and on the responsibilities and roles in the project. He took a secluded but pivotal position in the setup, and though his Danish was hard to understand and he was not a good informant, he is a source of valuable inside experience.

Two interviews were conducted with former pupils together with one of their parents a year after they moved from the settlement to a town. The timespan affected the narrative coming from these interviews. In both interviews the pupil and the parent added positively charged nostalgia to the description of their distance teaching experiences. This must be kept in mind when using this data. On the positive side, the timespan provided comparative data as both the pupil and the parent related their distance teaching experiences to the schooling in the town where they lived at the time of the interview.

A document written by the project manager adds to the data. He has a technical background and no formal academic training. The short report is a rudimentary presentation and evaluation of the process, addressed to politicians and administration for more support and recognition. Technical issues, as well as pedagogical aspects, are addressed in the report.

Data come from two observations of the teachers managing distance teaching from the school in Nuuk. A lesson on philosophy and religion was spent on Greenlandic grammar. A following lesson in Greenlandic was spent on pupils writing a story. In both lessons I was present with the teachers in Nuuk, with the pupils simultaneously present on screens and through a smartboard. The teachers' actions and behavior are the focus in these observations as they are done from the teacher's position in the distance teaching setup. The observations were done late in the process, and the teachers were confident in the project and with my research and presence.

The final type of data comes from video recordings. The recordings were made by a second project manager associated to the project at an early stage. Both project managers were obviously proud of their operations in the Greenlandic school system, which were and are ground breaking. The second project manager edited the video recordings to give a positive and convincing presentation to politicians and the public. The video material shows how the distance teaching is done while, at the same time, the editing reflects the success criteria driving the project. Selected still photos from these recordings are shown in the following.

All interviews have been transcribed. Translation from Greenlandic to Danish was necessary for part of one of the interviews with a pupil and a parent. The observations of distance teaching also needed some translation, which was done on the spot by the teachers themselves.

Data analysis

Data was collected for work on Grounded Theory. The analytical process in this method is a dynamic alternation between coding the data, looking for categories, developing categories and further data collecting. An ambition is to keep the process open ended for as long as possible. The result is new theory grounded in the field of research. In this paper, the

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process is not brought to the development of new concepts and new theory. Data is employed to enlighten a specific question.

Data from Grounded Theory is very open ended and rich, which makes it suited for a case study revolving around a determined question. The analytical process moved between the different types of data. This was possible because the topic and my research questions were relatively clear from the outset: looking for conventional or progressive teaching, and for roles assigned to or taken up by pupils and teachers.

ANALYSIS: A SCHOOL FOR THE VILLAGE

In 2010 the situation in the settlement was that the children did not go to school. The village has a building combining a school and church that had been in use as a school some years prior. However, it had been several years since a teacher had lived at the settlement. The municipality is responsible for providing or securing teaching for every child of legal school age. The solution until 2010 had been to support parents with homeschooling. Now new possibilities came about through better internet technology. During the summer of 2010, the municipality installed smartboards and active monitoring cameras in the school building. A sponsorship from the internet provider in Greenland was used to establish an internet connection in the village. A handful of educated teachers working in Nuuk were employed as distance teachers for the settlement, and a room with a similar setup as the village school was established at their school.

Once the project started, the teachers and project manager quickly learned that the parents had failed at homeschooling their children. According to the project manager and the teachers, the children were significantly behind on school subjects; it was almost as if no learning had taken place for a couple of years. The teachers detected the academic level with the children and related it to the standards of the official national curriculum. They divided activities into school subjects, selected relevant material, and adjusted the children's schedules to that of the city school where the teachers themselves were employed. From 2010 on, the children followed a timetable made up of synchronized distance teaching.

Valuable informants to the teaching that followed are the boy mentioned in the introduction and his mother. The family was fluent in Danish and spoke Greenlandic well. With a higher education, she held the only local authority job in the settlement. According to the mother, her family was the prime initiator of leisure time activities in the village. She defined the village people as dormant:

> …it's not because they are behind or poorly provided knowledge wise they are just… dormant. And waiting for something to happen. And when something happens it's the holy word: they do what is asked of them (my translation from Danish; Øgaard 2015, p. 106).

The mother observed other parents' curiosity about the distance teaching, and parents taking an interest in the school. The solution was accepted by the parents and in the village, seemingly without reservations or protests.

The supply teacher living in the village and working at the school expressed great appreciation and respect for the distance teachers affiliated with the project. He believed they were very skilled, though he could not define what gave him that belief.

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When the distance teaching arrived, it was defined as the authorities coming to the village from the outside, establishing officially sanctioned schooling. With the distance teaching there was an important and secure placement of responsibility for schooling with a professional staff.

A distance teaching solution for the school

During an interview, one of the teachers reflected on distance teaching as an exceptional experience:

> I take it as normal teaching. I teach, it is just a little bit different; we have more to do with technique, with our smartboard, where we have this contact (my translation from Danish; Øgaard 2015, p. 111).

The teacher viewed distance teaching as normal teaching; she did not think of it as an opportunity for pedagogical development or as something demanding didactical changes. This approach was reflected in the chosen technical solutions. The primary technology in the distance teaching setup was the smartboard. It replaced the blackboard and served as a hub for all communication between teachers and pupils. Interaction through the smartboard was accompanied by sound transmitted through microphones and speakers. Cameras would transmit physical movement by teachers and pupils.

The pupils were often situated in rows facing the smartboard. Common collective activities might be going through the correct spelling of selected words, or collectively correcting the grammar in a pupil's writing. In math, distance teachers would write math puzzles on the smartboard to be solved by a pupil who was called to the smartboard in the settlement, as shown in the photos.

Translation:
– Yes, that is also the ones I use.
– But what did you do with the two numbers 14 and 23?

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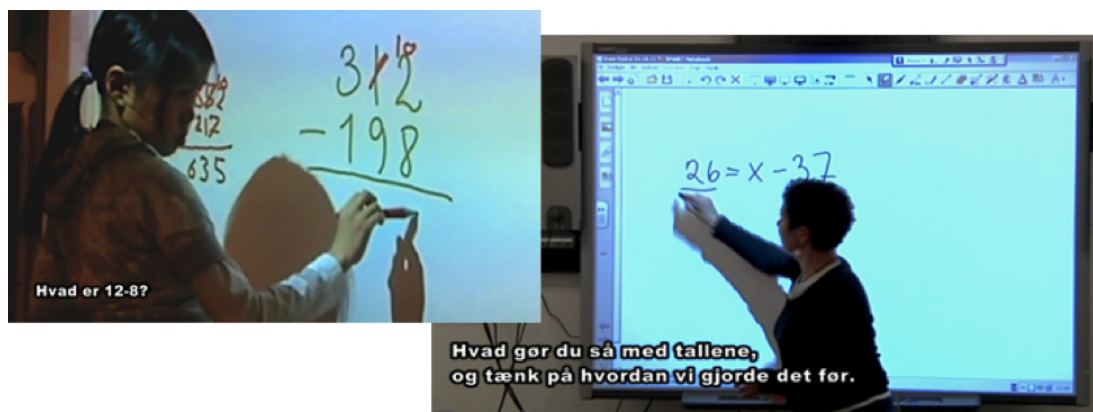
Translation:
– What is 12 minus 8?
Translation:
– What do you then do with the numbers, and think how we did before.

The group of pupils was very heterogeneous in terms of maturity and academic level. The teachers made an effort to differentiate their teaching. The teachers gave and evaluated individual tasks and assignments. When not interacting with the teachers, the pupils sat on their own working on assignments using paper, pencils, booklets, and, eventually, a counting frame.

The pupils would write in hand in their booklets and when an assignment was done they eventually went to the smartboard to write on the board what they had written down so the teachers in Nuuk could evaluate their work.

The teachers would follow the progression on each subject through the use of printed book materials. For this, a technology much used by the teachers was a document camera. The teacher or a pupil would take a book and put it under the camera to show which page they were on and point where to look on the page.

There were some personal computers present with the pupils in the settlement and occasionally they were used. The teacher teaching Greenlandic had the pupils play simple language games or solve crosswords on the computers. When done, the supply teacher who was present with the pupils would go to the smartboard and inform the teacher in Nuuk of the pupils' results.

The digital technology served to support the use of books, booklets, pencils, a blackboard (the smartboard), counting frames and so on. The distance teaching was dominated by analog technologies associated with the traditional classroom. In this way, the digital technology served to establish conventional analog classroom teaching.

The school in the settlement featured a full-time supply teacher. His main function was to turn on the smartboard and computers, hand out materials, and take care of similar supportive tasks for the teachers in Nuuk. He was not expected to support the teaching in any other way. He was present with the pupils throughout the school day. In the photo he can be seen in a black t-shirt. Based on the interview with him and video recordings, he seemed to take on a very passive role in the distance teaching, not interfering with the dissemination of subject matter.

The School Act in Greenland also includes cross-curricular feature weeks involving creative and practical activities. These are placed within the subject "Local Choices," which is a select subject for the school in Greenland. It comprises practical, aesthetic, and musical topics, including arts and crafts, architecture, music, drama, and sports. Creativity and practical activities are the focus of this subject.

Local Choices and cross-curricular feature weeks are a deviation from conventional classroom teaching. These teaching activities stem from progressive pedagogical thinking, where one finds a broader and more inclusive view of the pupil.

When the teachers in Nuuk were engaged in cross-curricular feature weeks at the city school, the distance teaching in the settlement stopped and the supply teacher was expected to take over. The supply teacher was also responsible for teaching Local Choices. The fact that the supply teacher, who had no formal education and seemed insecure and reluctant to teach, was expected to take on this responsibility shows how progressive pedagogy had a very low priority in the distance teaching solution for the settlement.

The project manager from the municipality shared responsibility for pedagogical and didactical decisions with the teachers. In his report, he made a few remarks regarding his expectations for the distance teaching:

> The teaching is to be planned individually so it fits the academic level [of the students]. It can start out with a theoretical reading for everyone or for more pupils, some pupils then start working, and then for pupils at a higher level, there can be building upon the theoretical reading (my translation from Danish; Øgaard 2015, p. 110).

Meeting the curriculum is the central concern. Pupils as well as teachers are expected to follow given content and progress in a prescribed way. Abstract school knowledge is preferred. As I understand the practice described above, the teaching was in line with what the project manager expected and wished for the distance teaching project.

Authority and behavior in distance teaching

The teachers in Nuuk controlled the cameras in the settlement. They could follow the pupils' activities and behavior as they were working, or as they went to the smartboard and back to their seats. In an interview, one of the teachers explained why the monitoring cameras were important to the project:

> Because you want an overview and have control. I can't manage or make her [a pupil] do it if I can't see on the screen if she is doing something completely different. I have to see what she is doing even though I see what she is writing on the smartboard. (…) She can't just sit on the floor where I can't see what she is doing. (…) It is for sake of my teacher role—I must have control over my teaching (my translation from Danish; Øgaard 2015, p. 112f).

The teacher felt responsible for teaching the curriculum, as well as transmitting attitudes and manners to the children.

The boy who confidently stepped into the distance teaching classroom was, according to the teachers, the most active pupil. This caused them trouble:

Because he expresses his opinions and when he does something he wants it his way. He tries to manage the teaching instead of me managing the teaching or the teachers who run it. He wants to do it his way (my translation from Danish; Øgaard 2015, p. 113f).

Independence and taking responsibility were not the roles or the behavior expected from the pupils by the distance teacher.

The project manager referred to an instance with the boy in the start-up phase. A distance teacher asked the boy to take a seat and do his school work. The teachers were attempting to "straighten him out" from Nuuk. The project manager applauded the teacher during the interview and called it the "litmus test" showing whether the setup would work.

The boy himself spoke of his behavior in the school as participating and taking responsibility for the activities. In his own and his mother's words, the boy was very engaged in the different assignments and working through the material presented by the distance teachers. He also took on the task of teaching Danish to other children. The instance mentioned in the beginning where the children met the distance teaching situation for the first time also showed the boy taking responsibility for dissolving the tension and helping the teachers to get on with the distance teaching.

The teachers' experiences with the boy, and the way in which he expressed his intentions and behavior, contrast with each other. The teachers believed the boy did not have acceptable manners and the right behavior for their teaching method, while the boy and his mother saw the school as offering an opportunity to take part in his education and flourish.

Compared to his current schooling, the boy's experiences in the settlement were positive. This was due in part to the teachers' high expectations and close monitoring of his academic progress, and in part to a situation leaving room for his engagement. The absence of professional teachers at the school and gaps in the distance teachers' surveillance might have offered the boy a feeling of freedom, encouraging him to use his resources to take responsibility. However, it was dependent and disciplined pupil behavior together with traditional teacher authority that was the intention with the distance teaching project.

In 2016, a new internet provider was assigned to the project. Subsequently the internet connection became unstable and the distance teaching stopped. However, the situation had by then changed and there was a professional teacher living and working in the settlement. The school is now considered a separate professional school in the school district. Assigning only one teacher to the settlement to teach all subjects, at all levels, is a demanding and vulnerable solution. The teachers at the city school were asked to continue the distance teaching, likely because they are respected teachers. However, because of the unstable internet connection and a reluctance to fix it, the teachers refused. There are currently no plans to utilize distance teaching in the settlement again.

DISCUSSION

In the editorial introduction to the *Nordic Journal of Digital Literacy*, Søby (2011) writes

"Digital media and ICT could serve as an impetus and hub for innovation in the lower secondary school. An exciting thought for lower secondary education may be to develop a virtual school that offers online and pupil-centric education and that uses new forms of learning and collaboration." (p.5)

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Under the headline "New Learning Models" from their "Fast Facts About Online Learning," the International Association for K-12 Online Learning (*i*NACOL, 2013) states

> "iNACOL wants to accelerate the development of effective new learning models that are necessary for the field to achieve its potential. Online and blended learning models that are competency-based provide enormous potential for transforming the education system toward student-centered, personalized learning." (p.4)

These quotes exemplify the expectations associated with ICT and distance education. In this case study, distance teaching and ICT was utilized to facilitate conventional classroom teaching at a distance. Research has suggested that smartboards support traditional classroom teaching by keeping the teacher as the active part of the classroom and in command (Gillen et al., 2007; Guðmundsdóttir, 2014). This was how the interactive smartboards worked in the settlement. They served as the dominant technology in order to simulate a traditional school environment where the teaching, essentially, was composed of pupils answering questions and fulfilling tasks at the request of the teachers, or from school books.

Greenland has more than 60 small settlements; 13% of the population lives in these places (Grønlands statistik, 2016). The sustainability of these villages occasionally forms a substantial political discussion, the villages representing an idea of an authentic Greenlandic lifestyle. The primary condition for a settlement is plentiful hunting and fishing grounds, but equally important for its survival are infrastructure and institutions (Hendriksen 2013). These are needed for a village to be recognized as such, which allows inhabitants to claim shopping possibilities, roads to be maintained, ferries to visit regularly and so on. In that respect, it becomes important for the settlement to have a building that is officially recognized as a functioning professional school. Hence, the endeavor was not pedagogical experimentation or development, but quite the opposite. For the long-term survival of the settlement, a normal conventional school was needed. In this case, distance teaching and ICT served the purpose well.

An important technology in the setup was active cameras. These were not primarily intended to support communication on school subjects, but to ensure correct behavior and to help the teachers communicate the right demeanor. When the children were first introduced to the distance teaching setup described in the introduction, they instinctively recognized the potent, powerful setting they were about to step into. Following the concept of power in Michel Foucault's work (Foucault 1994), it is difficult not to see the monitoring cameras as serving the internalization of self-surveillance, self-discipline, morals and diligence in the settlement's children. This endeavor also explains why a supply teacher needed to be present at all times, even though his work assignments were quite modest. Active cameras, synchronous communication on a smartboard, and a person present at all times is a massive degree of monitoring for, at times, only two pupils in the room.

Access to education is at the core of the legitimacy of distance teaching. In this case, distance teaching supports the municipality's responsibility for providing access for all citizens to legitimate and approved schooling—but it also gives the municipality access to its citizens. If the mother's experience of dormant village dwellers is true, if the home schooling prior to the distance teaching project was actually neglected by the parents, there is reason for authorities in a modern society to work on the optimization of its citizens.

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It could be argued that schooling that transmitted self-discipline, in conjunction with core knowledge and skills, was relevant for the village dwellers. The children may not have been ready for progressive teaching demanding autonomy, critical thinking, self-management, responsibility, creativity and collaboration. Traditional classroom teaching may have been their requirement.

I find this late arrival of conventional schooling in the outer districts to be too late. The schooling in the settlement does not prepare the children for taking part in life in the 21st century. ICT, in this case, is in the service of educating to the work ethics of the 20th century.

The boy mentioned in the beginning thrived with the distance teaching setup. Compared to the situation where the settlement did not offer daily activities for the children, the boy took great advantage of the distance teaching setup. He did so by showing engagement, responsibility and collaboration with peers. Yet, he might have gained more from an elaborate use of ICT aiming for the potentials mentioned in a lot of research on ICT use in schools (Beldarrain 2006, Erstad 2008, Erstad 2010, Sørensen, Audon & Levinsen 2010, Sørensen & Levinsen 2014). iPads and extensive use of collaboration on internet platforms with peers and other teachers might have been more in line with his needs and potential. Furthermore, it would be in line with the needs of every child in the 21st century, and in line with what is written as learning goals in the Greenlandic School Act.

CONCLUSION

The solution from Greenland adds to the scope of distance teaching with school children.As mentioned, providing access to education is a common reason for applying distance teaching. The distance teaching provided the children in the settlement access to a professional, functioning school. Through distance teaching, it was possible to establish a legitimate school transmitting sanctioned knowledge and skills, and fostering diligence. However, the teaching unfolded far from discussions on 21st century skills, detached from dominant discourses on digital literacy and children's competent use of digital technology (for introduction to dominant discourses, see among others Sørensen & Levinsen 2014, Erstad 2010, Bennett et al. 2008).

The case shows how it is possible to use distance teaching and advanced digital technology to establish traditional classroom teaching. It questions the dominant expectation that ICT and distance teaching will teach independence, self-management, and collaboration to students. No a priori connection was found between ICT-driven distance teaching in schools and pedagogical development. ICT and distance teaching might even work to reach opposing ends, as is the case in this study. Digital or media literacy does not emerge from distance teaching, or from the use of digital technology. Deliberate choices have to be made for distance teaching to meet progressive learning goals.

The boy could take advantage of the opportunities coming from the distance teaching setup. However, although it was a technologically advanced school, he frequently missed out on a number of opportunities for media literacy.

As well as providing access to education, distance teaching also gave the municipality access to its citizens living in remote areas. For the boy, the state's embrace of its rural citi-

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zens was an outdated endeavor. He was ready for a more dynamic, richer school day that allowed him even more responsibility, autonomy, and collaborative opportunities. Thus, distance teaching saved the boy at the same time as letting him down. The authorities embraced and included its citizens through distance teaching, but did it in a way that did not transmit contemporary, relevant and progressive learning goals, thus succeeding and failing at the same time.

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Digital professional development: towards a collaborative learning approach for taking higher education into the digitalized age

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ABSTRACT

In Norway, digital skills are defined as an essential proficiency in the national curricular plans, and learning worldwide is in many ways changed by contemporary Web 2.0 technologies. Even so, teacher training is lagging behind when it comes to developing digital learning cultures and providing digital role models for future teachers. At the Norwegian University of Science and Technology (NTNU), we used a Massive Online Open Course (MOOC) approach to provide a digital professional development (DPD) program to faculties at the Department of Teacher Training. A main idea was to develop this program at the meso-level (horizontally) with some mutual structures and offerings, avoiding a top-down approach, which, based on experience, is likely to fail. The findings in this study present a four-step model, the collaborative learning approach (CLA), to account for the development and implementation of a blended learning MOOC (bMOOC) for professional digital competency development.

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INTRODUCTION

Digital competence, which comprises digital knowledge, skills, attitude and literacy, has become a key competence in education in most developed countries. Norway is currently one of the most digitized countries within the OECD area. Digital penetration in several sectors of the society demonstrates Norway's digital maturity and readiness (OECD 2017). However, the government's strategy for digital competence development (Kunnskaps- departementet 2017a) emphasizes the need to further strengthen the use of ICT in the entire educational system to prepare for working life. The focus on the possibilities afforded by digital technology and the emphasis on digital skills development put Norway in the digital forefront and make the country a case well worth studying.

In 2005, the Norwegian government defined digital skills as one of five key competences (Kunnskapsdepartementet 2005) and since then, all high school students have been pro- vided with laptops. Initially, digital skills were linked to practical knowledge of various software programs (Erstad 2010). Over the years, however, a more sophisticated under- standing of digital competence has developed; the upcoming generation should be able to use and produce multi-media content productively to learn, communicate, collaborate and present their work to various audiences. Furthermore, digital skills and digital literacy involve the ability to act responsibly online and to be conscious about an ethical use of the internet (Utdanningsdirektoratet 2015). Lately, there has also been a discussion as to the dangers that lurk online, for instance cyberbullies, haters, and trolls[1], and on how to enable teachers and parents to protect their children against digital risks[2] (PACER Center 2013).

Despite government policies, Norwegian teacher training institutions are lagging behind when it comes to encouraging new teachers to use ICT as tools for learning, com- munication and collaborative knowledge development. A report from 2013 (Tømte et al. 2013) states that teacher training in Norway does not live up to the expectation to educate digitally competent teachers, and that faculties in these institutions are mainly making use of traditional teaching methods. When used, technology is mostly limited to learning man- agement systems (LMS) to administer learning, presentation tools to scaffold lectures, interactive tasks with instant feedback and digital portfolios to store and retrieve student work. Even if the teacher trainees belong to the digital generation, as coined by Tapscott (1998), they have limited knowledge about digital technology and social media when it comes to using these as tools to scaffold learning in didactical settings. Langseth (2012) shows similar findings and concludes that this is a fair picture of teacher training in Nor- way. The research suggests that teacher educators and student teachers follow the digital development in general, but that their awareness vis-à-vis digital technology and digital professional development is more poorly developed. This points to a challenge for the teacher training institutions.

In this study, we followed a group of pre- and in-service teacher educators in a vocational teacher-training program. The study took place from January 2014 to December 2016 at the Norwegian University of Science and Technology (NTNU). The teacher educators devel- oped a blended learning MOOC (bMOOC) on digital learning and offered it to fellow

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1. See for instance Commonsense Media, https://www.commonsensemedia.org/cyberbullying
2. Medietilsynet/ Nettmobbing: http://www.medietilsynet.no/barn-og-medier/nettmobbing/

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teacher-training faculties as a resource to enhance their digital professional competencies. A main research goal in our study is to identify elements that will contribute to a change in digital practices after completing a digital professional development (DPD) program.

DIGITAL DEVELOPMENT IN INSTITUTIONAL SETTINGS

Over the last forty years, many institutions in higher education worldwide have initiated faculty development programs and other measures to enhance the quality of teaching and learning. Institutions usually organize the training in designated units where university teachers will come for shorter programs, usually between 7, 5 and 15 ICT credits. During the same period, learning environments in universities have changed significantly. Pedagogical understanding and discourse has developed, technology has offered unprecedented opportunities for access to education and enrichment, academic staff have engaged in reflections on their teaching, and recruiting students from new populations – ethnic, socio-economic and gender-wise – has indeed required new educational approaches (Chalmers & Gardiner 2015).

According to Bates, web 2.0 technologies, such as blogs, YouTube, smartphones and cameras, virtual worlds, and e-portfolios enable learners to collect, create, transform, adapt and share learning materials. Furthermore, these online tools can be used for collaborative learning, group work and projects, problem solving and creative thinking to develop necessary aptitudes in the knowledge economy (Bates 2010).

So far, higher educational institutions have been slow on the uptake of the benefits afforded by new technologies. Bound by tradition and accepted practices, and organized in geographically defined units, Bates (op. cit.) suggests that the old universities are likely to fall behind the more flexible "for-profit universities" in the pursuit of new methods of teaching and learning. According to Bates, this is mainly so because faculties will try to implement new methods in the existing structures and practices that have been there, literally, for centuries.

A fairly common and well-known approach to digitalization is individual, tool-focused and campus-based courses to implement tools already purchased by the organization. Typically, training relates to a certain digital infrastructure, such as an LMS, that the institution expects faculties to use in their courses. According to Kennedy (2006) such top-down oriented approaches normally comprise of centrally or externally delivered course content that will support existing routines, curriculum plans or even a political agenda. In addition, educators are also usually left with a limited degree of autonomy. Not well received by educators, these approaches do not necessarily serve the purpose of new digital practices or support the necessary change in educational cultures.

Nonetheless, the digital delay is probably also rooted in the long tradition of academic freedom, where autonomy to design courses according to personal pedagogical beliefs and established pathways is a key feature. A long tradition of freedom of individual professional development is also a main value contributing to this (Mårtensson & Roxå 2016). These traditions leave digitalization in the hands of individual faculties and let personal interest, values and preferences point out the direction and milestones for development.

Neither institutionalized top-down approaches at the macro-level, nor individualized private initiatives at the micro-level seem to bring the institutions up to standard when it comes to new technologies and disruptive practices. The meso-level, which is to be found in between these positions, also entails problems. Research into higher education in Scandinavia (Mårtensson & Roxå op. cit.), shows that peer engagement for teaching is highly collegial and contextualized. At the meso-level, we find micro-cultures that can be described as strong or developing. Mårtenson & Roxå find that *strong* cultures are resilient to change and tend to develop from micro-cultures where individuals co-shape their habits, norms and traditions over time. Faculties in these settings consider themselves autonomous and self-controlled and share certain assumptions regarding teaching and assessment that are implicit in the culture. Strong micro-cultures also take certain ways of securing high quality teaching methods with long traditions for granted.

Developing micro-cultures, on the other hand, share an interest in innovation, creating and shaping new approaches and new ways of interacting in and outside the group. Research on higher education carried out in Norway found that the attitude to new technologies in these two types of micro-cultures may impede or encourage digitalization (Fossland 2015; Jacobsen 2017; Langseth & Haugsbakken 2016). Consequently, leaving digital professional development entirely to the meso-level is also not a sustainable strategy when it comes to developing well-informed digital practices in higher education.

A brief review of the existing research literature confirms that digital professional competence is unevenly distributed among educators. In her study on digital enthusiasts in Norwegian higher education, Fossland (op. cit.) found that educators have developed pedagogical ways of using new technologies that will meet Norwegian and European standards related to educational flexibility, social cohesion, lifelong learning and the use of learning object repositories (LOR). She also found that their teaching relates to central aspects of quality in higher education, such as pedagogical variation, collaboration, authentic learning, and relevance for working life, constructive feedback and internationalization. At a strategic level, Fossland found that most Norwegian universities have developed some form of digital strategy. Nevertheless, the focus in these strategies is typically on digital infrastructure, technical support and short "top-down" courses on how to use specific digital tools. Pedagogical uses of new technology to enhance education in a long-term perspective, were rarely mentioned in these documents.

A national, quantitative report on higher education in Norway (Kunnskapsdepartementet, 2017b) states that educators' digital competency development is a long way down on the leadership's agenda and weakly anchored in educators' course descriptions, learning objectives and obligatory tasks.

The latest national model for faculties' pedagogical competency development comprises between one and two hundred hours of formal training, focusing on planning, learning activities, teaching, assessment and reflection. Learning objectives in these areas tend to emphasize the uniqueness of higher education, omitting, to a certain extent, digital competences and reflections on learning activities in digital environments (Lid, 2014). As for digital tools, the emphasis is on mastering the technology and its pertaining applications. Despite the emerging body of pedagogical literature on digital teaching and learning in higher education, an overall discussion, e.g. on how new technologies may change education and learning processes, seems to be missing.

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"Studiebarometeret" (the study gage), a survey done by the National Board for Quality in Education (NOKUT 2016), reveals that most Norwegian students see digital media as important tools to promote cooperation and flexible learning. However, they are not so unanimous when it comes to how these media can increase motivation, determination and creativity. In these areas, most students do not experience digital media as important contributors to learning quality. An intriguing conclusion from the study is that these findings point to a strong potential for better use.

The new "St. melding nr. 16" (2016–2017) *Culture for quality in higher education* outlines several educational key concepts, e.g. assessment for learning and deep and transformative learning, stating that it is up to the institutions to find ways to meet these challenges. One of the measures from the government to make this happen is to offer personal incentives.

In brief, there seems to be an understanding of the need for change, both strategically and pedagogically, to prepare students in higher education for the digitalized age. However, institutions and individual teachers are offered a great portion of autonomy in how to deal with digital professional development.

In this study, we explore a middle-situated digital competency development initiative based on continuous collaboration among faculties and internal developers. Since knowledge acquisition apparently does not develop from externally defined designs at the macro-level, we move away from these top-down initiated courses to a middle-situated initiative based on continuous collaboration and research informed inputs. The assumption is that developing high digital competence in micro-cultures at the meso-level is a result of learning processes among professionals. Healey and colleagues (Healey et al. 2013) also support this hypothesis when they point out how change is based in networks with shared visions, goals, facilitation and individual reflections. In Norway, Postholm (2016) also finds that such collaborative settings have a positive effect on teachers' learning.

THE SMART LEARNING INITIATIVE

"Smart learning" (SL) was one of four projects funded by the top management of the NTNU and designed to improve the quality of education in the institution. The initiative, targeting teachers' and students' digital competence development, was a collaboration between the Department of Sociology and Political Science and the Department of Teacher Training. The project team involved five members, with different roles and complementary backgrounds, ranging from teachers and researchers to technical staff. Smart Learning's main product was a national MOOC on digital competence development running from 2014–16.

A by-product, the Smart Learning for Teacher Education (SL-TE) bMOOC started out as an explorative, collaborative learning network among a group of teacher trainers with an interest in educational technologies and disruptive learning practices. They decided to make a MOOC and, upon completion, they offered the MOOC to the entire teacher-training department. The vision was to develop and enhance online cooperation and networking among these educators and their students. The local management recognized the initiative, but never strategically anchored it in a local plan for digitalization.

Considering the relatively restricted number of participants, the term MOOC may seem inaccurate. However, the bMOOC with its digital architecture and the online accessible content, is scalable and flexible enough to meet the definition of the concept.

The program was meant to work as a form of continuing education for faculties. A main intention was to encourage faculties to use new technologies and social media, thus turning them into role models for other teacher educators and future teachers. A classic study by Lortie (1975/2002) showed quite early on that teachers do what their own teachers used to do and not what they are taught to do during their own pre-service training. Modelling good digital practices in teacher training is therefore of critical importance.

In an international review of 42 articles on student teachers' digital development, Røkenes & Krumsvik (2014) describe eight characteristics of successful digital competence development in teacher education. These are collaboration, metacognition, multimodality, modeling, authentic learning, student-active learning, assessment, and bridging the theory and practice gap. Interestingly, these are all recognizable and well established pedagogical concepts. We therefore claim that, rather than the pedagogical concepts embedded in the new technologies, it is the lack of knowledge related to the applications, hands-on skills and attitude that keeps educators in higher education away from using new technologies. The necessary question that arises is how to bridge new technology and educational concepts to develop actual digital competences that may enhance students' learning and social belonging while limiting drop-out rates.

In our recent research (Langseth & Haugsbakken 2016; Jacobsen 2017), we found that stakeholders may benefit from MOOC technologies to develop their digital competences, and that MOOC technologies may contribute to instigating sustainable educational change. The actual bMOOC approach was designed to offer the necessary scalability and flexibility to attract all faculties and inspire new digital practices across the entire teacher training department.

RESEARCH QUESTIONS

This case study follows the trajectory of an action research initiative where some of the activities were planned and implemented along the way. Apart from an overall idea to test out how DPD could be implemented from the meso-level, a stringent research protocol was not established in advance of the study. A main goal for the study was rather to identify components along this pathway that could contribute to the development of productive digital practices in a learning community.

Our research questions are as follows:

1. What components contributed to digital professional development (DPD) among the educators we follow in this study?
2. How can we describe a productive digital professional developmental process at the meso-level in a higher education institution, such as a teacher-training unit?

METHODOLOGICAL APPROACH

This case study was a part of the Smart Learning for Teacher Education project. The study developed through four phases. The first phase, lasting from January to April 2014, was the preparatory stage where teacher educators, after a general e-mail invitation, volunteered to partic-

ipate in a community of digitally interested colleagues. These faculties met on a regular basis, reading books, articles, testing tools and discussing approaches to digital learning. The focus was mostly on social networking and sharing to gain insight into digital learning. Data collection in this first phase consisted of participatory observation and field notes from the meetings.

In the second phase, from April to August 2014, the focus was on producing the MOOC content. All contributors had access to the online MOOC platform Canvas, and produced texts, videos and assignments and uploaded them to the platform. Each participant was responsible for one module, but everybody shared a mutual responsibility to give feedback and find digital tools that could serve a pedagogical purpose in the different modules. In addition, the participants also developed a theoretical framework to help MOOC participants make sense of the tools in a wider context. In this second phase, the main data come from both informal conversations and qualitative interviews with the MOOC developers.

The third phase, from August 2014 to December 2014, may be described as the implementation phase. The MOOC was offered to all faculties at the Department of Teacher Training, with 40 faculties signing up initially. It started with an open workshop on campus in August, with a new module introduced every three weeks throughout the semester. After the last module, there was a new workshop on campus where the participating faculties reported on how their newly acquired skills had come into use in their everyday professional work. In this phase we collected both participant observational data as well as two sets of interview data; one from some of the participants and one from some of the MOOC authors.

After closing the MOOC, there was a fourth phase concerned with changing the educational culture. This phase can be dated from January 2015 to December 2016. A main ingredient was faculties trying out new skills and testing new approaches to teaching, learning and assessment. In this phase, the project leader also further urged drop-outs to complete the MOOC in order to reduce attrition and enlarge the community of digitally skilled faculties. In this phase the MOOC developers also supported vocational teacher training faculties who tried out new assessment methods in their courses. Main methods in this phase of the data collection were participant observation, qualitative interviews and surveys. An overview of the four phases and pertaining methods is rendered in Table 1 below.

Table 1. Overview of data collection

Phase	Period	Methods	Number of informants
Phase 1	Jan–April 2014	Participatory Observation Qualitative interviews*	N/A 5
Phase 2	April–Aug 2014	Participatory Observation Qualitative interviews*	N/A 5
Phase 3	Aug–Dec 2014	Participatory observation Qualitative Interviews* Qualitative interviews** LMS-data	N/A 5 3
Phase 4	Jan 2015–Dec 2016	Participatory observation Survey Qualitative Interviews**	N/A 38 5

* These interviews involved the teacher educators who participated in phases 1, 2 and 3.
** These interviews were conducted in fall 2016 with the vocational teacher educators who joined the MOOC course in phases 3 and 4.

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In addition, we also harvested numerical data from the learning analytics tools in the Canvas platform. Not primarily designed for research purposes, its statistical capacities are undersized, but, due to a relatively small group of enlistees (N = 40), this could be done. Both manual counting and re-entering of the data were used to draw information from Canvas. The data describe participant behavior along such parameters as regularity of page views, participations, relative activity and number of assignments submitted.

The overall methodological approach may be described as action research (Creswell 2012) where research methods are mixed (Creswell 2011) to answer the research questions and develop new insights. An obvious reason for describing this as action research is the design that evolves along the way, depending on accumulated experience and knowledge. In addition to being a research project, this was also an effort to develop a MOOC that would address some of the issues connected to teacher trainees' and teacher training faculties' job related digital challenges.

FINDINGS

Phase one, preparatory phase: The project was introduced as an open invitation to 78 faculties in the teacher training unit to participate in a peer group focusing on new technologies. Seven of the invitees turned up for the first meeting and formed a group of digital interest, agreeing to spend time together to develop their digital competence. There were no predefined learning objectives or assessment criteria, but they found a common interest in better understanding the potential of new technology in educational contexts and exploring the use of technology to enhance learning practices.

The group organized meetings on campus every two weeks and created a 24/7 community on Facebook. The group shared, curated and discussed pedagogical ideas, educational experiences, research, new technologies, new digital concepts etc. at flexible times.

The group mentors organized the meetings, curated literature, challenged beliefs and pointed to new technologies and possibilities. The group also read Howard Rheingold's book "Net Smart: How to thrive online" (Rheingold & Weeks 2012), and discussed concepts and tested out links and digital tools in the book.

At the organizational level, the local management was informed about the activity; they granted some money to buy books and some food and beverages for the late afternoon meetings.

According to the interview data, this was a motivating experience for the participants and they pointed out the community as a main success factor. One of the informants tells us that he likes

> "to work with OK people who are creative—innovative. I get new ideas myself, and it leaves room for self-development. The collaborative feeling adds to the motivation [….] I was inspired by the MOOC experience."

The group was also a main learning experience for the participants. Another informant tells us how he has

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"always been interested in technology, and now there is a new wave of technologies coming over us. … and how do I use this in my teaching? I spent some five hours a week learning new stuff and I learned a lot."

Overall, the group that was formed in phase one of the project became an important community of learning where the participants both challenged and inspired each other's beliefs and aptitudes related to digital learning.

Phase two, the production phase: After three months the participants had crystalized various areas of interest related to digitalized teaching and learning. Personal (online) learning networks (PLN), attention and multitasking, digital assessment practices, student response systems (SRS) in flipped classrooms and the use of Smartboards became main headings. Pertaining to their principal interest, the participants took responsibility for one main topic each. Inspired by the main Smart Learning MOOC project mentioned above, these topics were then organized as modules. The faculties then developed the content of their respective modules, but collaborated when learning how to use the Canvas platform. They also gave feedback on each other's work as it progressed. The work resulted in seven modules with explicit learning objectives, assessment criteria, as well as texts, articles, videos, and tasks to be completed on the way.

The Smart Learning project paid to get the MOOC online on Canvas, and the faculties who produced the modules were compensated with a fixed sum provided that they contributed when the course was offered to other educators in the department.

According to the interview data, working on the MOOC further deepened the working relationship between the participants and changed how they developed and shared knowledge. One participant states:

"We discussed the concept of MOOCs and we collaborated. The MOOC is an area for dialogue that can instigate innovation. If knowledge is supposed to be scientific, it must be shareable, open. […] We did not only talk about technology, we actually wanted to get to know the technology by focusing on the production of learning objects."

From the data, it seems that the spirit of collaboration that was developed in the first phase remained in the production phase, when the educators volunteered to take responsibility for different modules. The network that was developed in the early community of learning was still strong and productive.

Phase three, the implementation phase: The next step was to offer the digital learning MOOC to fellow colleagues. The 78 faculties in the teacher-training unit received an e-mail inviting them to a two-hour seminar after work. In the seminar, we presented the MOOC as a low stake, collegial initiative suited for everybody. Initially, there were forty registrations. The group that in fact started the module was a middle manager, her group of seven vocational faculties, some in-service mentors and the Smart Learning project team.

As mentors, we spent time both online and on campus, curating ideas, knocking on doors and guiding educators technologically when needed. The middle manager also allocated time for the seven educators to reflect upon their use of technology in the vocational courses. By the end of the semester, we arranged an informal knowledge sharing conference, focusing on the digital experiences from using the MOOC content in their

courses. The management attended both the initial seminary and the final conference in December.

As the course platform data show, none of the participants completed the seven modules or submitted many of the proffered assignments during the first semester. From the number of page views, we see that the first two modules were relatively frequently visited, but that the number of page views declined dramatically when module three opened. The participants' relative activity during the 18 weeks shows a similar decline, and if we look at the assignments, we notice that very few of these were submitted on time. This tendency grew as the 18 weeks progressed; there was less and less activity in the MOOC platform. To sum up the course platform data, it is fair to say that despite the fact that we invited a selected group, the majority of those who enlisted never completed the course as it was designed. This severe instance of attrition during the first semester is described in more detail in previous research (Jacobsen 2017).

Even so, several of the attendees seemed to benefit from the initiative during the first semester, using the course material to develop their own teaching. The attendees seemed to choose approaches and tools that they expected their own students to benefit from. In doing so, they also disconnected from the timeline of the course and redefined the proffered material from an xMOOC to a cMOOC, as defined by Bates[3]. In short, xMOOCs are designer controlled offerings usually comprising a specific platform, video lectures, assignments and some form of final assessment. cMOOCs emphasize networking and participant contributions where participants are in charge of their own learning process. The MOOC and the online learning material, hence, becomes a source they connect to in order to harvest good ideas and improve their own teaching.

The MOOC also had an impact on how these vocational faculties thought about using technology in their courses. One of the participants tells us in the interviews that:

> "During the MOOC, we worked together in the department. We had meetings where we discussed the use of technology in our courses, and we decided that technology should be a central feature in all our courses."

This was also an impression that the members of the Smart Learning project team shared. One of the team members puts it like this:

> "The vocational participants were enthusiastic; they wanted something, especially the vocational teachers. They are very close to working life, where digital tools are in use."

Another member of the team describes the course as an eye-opener in that it became clearer how new tools could be used, such as making videos when recording the screen. In our previous research, we have described how video recordings became the backbone of one of the participants' mentoring of her own students when she recorded her feedback and made it available as video clips (Jacobsen, 2017).

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3. In short, the terms xMOOC and cMOOC respectively refer designer controlled and participant controlled designs. For further explanations, see Bates (2016) Chapter 5.3: Variations in MOOC designs.

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Even so, attrition was a reality and some of the MOOC content was never opened by many of the participants. One of the developers expressed his disappointment in these words:

> "I put a lot of work into making proper lessons, varied assignments and even videos, and must admit I felt disappointed when most of the participants never got to my module and only a few looked at the material that I offered."

The message that the teacher training faculties sent in the interviews was that they needed time to absorb, develop and pilot new ideas in their courses, and that there were several other demands restraining their time, e.g. research, assessment and family. Another disappointment to the developers was that none of the participants wanted study points, and therefore there was no candidates for the exam that was one of the options in the course.

Phase four, **maintenance and dissemination of DPD**: After completing the MOOC course, there was a fourth phase concerned with changing the educational culture. This phase can be dated from January 2015 to December 2016 and comprises faculties trying out new skills, testing new digital tools with their students and disseminating their experiences and new insights to their colleagues. In this phase we further urged drop-outs to complete the MOOC content to reduce attrition and educate digitally skilled faculties. Access to the MOOC on Canvas was kept open until December 2016.

On the practical side, a main approach was to stay in touch with the group of vocational teacher training faculties. The project group continued as curators and mentors in the network that was established in the project. Group members socialized, attended meetings held at the section for vocational teacher training, gave technical and pedagogical support and kept the MOOC offerings and the internal Facebook group going. The vocational teacher-training group continued to work on the MOOC material and, in the fall of 2016, the project team also collaborated with the vocational faculties to embed a MOOC in an Erasmus+ proposal that was later granted funding.

A change worth mentioning is the digitalization of the exam in one of the courses in the vocational teacher program that took place in the spring of 2016. The students were asked to use videos to document their research and development projects. They presented the videos covering their research at a conference held at the university, and subsequently handed in their multimodal texts for assessment. In general, this student group had little or no experience with the use of digital learning technologies, but data from the qualitative interviews suggest that the teacher trainees perceived their learning outcomes very positively.

> "It's the most fun thing that I have done throughout my entire studies. I really believe that I can use it later in my classroom practice."

> "It is an interesting way of working. It's challenging for us, who don't have particularly much digital competence. It has been a steep learning curve. When I improve my level of knowledge, I can start using video in my classroom practice at the school where I work."

As suggested by the data, classroom practices may indeed change for these teacher trainees. A standard career for high school vocational teachers like these is to be trained in a voca-

tional profession, e.g. as nurses, mechanics or carpenters. After working as teachers for a few years, they will also undertake the pedagogical training required to formally qualify. This is where the majority find themselves when we meet them in the teacher-training program, ready to go back to school with a changed outlook on digital learning.

As a part of the research on phase four, and to explore further the learning experiences from the video production, we also did a survey with 38 students in the vocational program. The students were asked to evaluate certain beliefs according to a Likert scale. We can summarize the findings as follows: Almost 60 per cent of the students see a great educational benefit when using new technology. More than 80 per cent agree that the use of video technology can be well suited in their classroom practice. On the other hand, mastering the practical skills involved in making videos is challenging. In fact, 42 per cent of the students disagree that it was easy to make videos and 68 per cent agree that it is more labor and time consuming to make videos than to complete written assignments. The data also shows that it is more motivating to work with videos than with written texts. More than 50 per cent of the students also agree that they prefer text and video assignments rather than written coursework only. In sum, the vocational teacher trainees are positive towards using videos in the classroom, but they acknowledge that working with videos is both work and time consuming. The findings mainly support the statements from the qualitative interviews.

DISCUSSION

As to the first research question, asking for components that contributed to DPD, we find that the horizontal approach in this study is important and productive. Local initiative, participation, as well as the feeling of autonomy that the participants experienced, are important factors that support this argument. In the framework of the bMOOC concept, the participants were free to explore new applications at their own pace and to decide on which new technologies to implement and how to use them in their courses.

Second, *management* support was also of vital importance. The top management in the department promoted the initiative and supported the faculties budget wise with a small amount of money. This had a positive effect on motivation in general and legitimized the participating faculties' work and effort. Our study also suggests that the management at the meso-level should be involved. We found that the middle manager allocated both time for the educators to collaborate and space to instigate formal changes in their courses. As a result, participants were motivated to stay engaged over a longer period. The vocational faculties were the group that most eagerly went on to implement new technologies and disruptive practices with their students as an effect of the SL-TE initiative.

As a third factor, the project supplied a *personal learning network* (PLN), where the participants could find ideas and operationalize new concepts related to new technologies and digital learning. Faculties are regularly told to "go digital" and are often introduced to digital tools. The challenge, however, is to change this massive material into meaningful digital learning environments. ICT is embedded in what can be described as the fast world, which, according to Levy (2006), is fast paced, information intensive and technologically savvy. Our study suggests that most educators will need a PLN that can curate news in this enor-

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mous field, spanning new technologies, digital tools, blogs, tweets and ICT research. We found that developing micro-cultures at the meso-level could fill these roles when digital enthusiasts participate in the group. In our study, the digital enthusiasts were motivated colleagues who collaborated with other faculties as coaches, mentors and curators. As a fourth factor, these enthusiasts were probably an important force pushing the project forward.

A fifth factor is the availability of a knowledge bank of contextualized ideas related to humans and new technologies. The MOOC itself and its linked material served as such, or, in Siemens's (2005) terminology, as *nodes* that the participants could connect to for new ideas and practices. The faculties, to some extent, changed the rules of the game and turned the meticulously planned xMOOC into a cMOOC, where they dropped in and strategically picked the material that suited their needs and educational ideas (Jacobsen 2017). As mentioned, they also did not sign up for the optional exam. Even so, some of the vocational teachers tried out both video tutoring and digital exams with their students. In this way, the MOOC content and the video production tools that we offered became personal learning resources when they explored new digital practices.

The program that we developed in this study had four phases over two years: the preparation phase, the production phase, the implementation phase and the maintenance and dissemination phase. These four phases make up the *collaborative learning approach* (CLA) model at the meso-level. This model answers our second question: how to describe a productive digital professional developmental process at the meso-level.

The number of attendees varied in each phase. A common factor was peer initiative and learning. Even when the participants enrolled in the bMOOC, this was a resource they explored as a cMOOC, rather than a program they submitted to. In the fourth phase, ideas were also spread to the vocational teacher trainees, many of whom later expressed an inclination to test out the ideas in their own high school classrooms.

In the model, participants of equal standing, with their own ideas and agendas, come together to form a digital learning community, to build resources, to share these assets with other colleagues at the meso-level and to act as role models who disseminate new ideas to their students.

A limitation of the study, however, relates to the fact that out of the forty faculties who initially enlisted for the initiative, the main body of participants who stayed on and gained an obvious benefit from the initiative was a group of vocational faculties. As mentioned earlier, the fact that their middle manager allocated time for collaboration and space for formal changes, was evidently an important contribution. A second reason for this tenacity could be that they perceive themselves as belonging to one group, with a common identity. Participating in the MOOC initiative together with the others would let them sustain this identity and sense of belonging.

A third reason why the vocational faculties were the most determined participants could be that vocational experience outside schools had brought their attention to the digital demands in their respective professional domains. They knew that digital competence is important and useful in order to do the job that is expected. Hence, they are also willing to put in the extra effort that is needed to meet the standards. If this is the case, a main lesson to be learned is more actively to draw the attention of the more traditional faculties to the digital demands their teacher trainees experience, or will meet as future teachers.

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CONCLUSION

In her analyses, Kennedy (2006) describes varieties of professional development along the following path: *transmission*, which is used to transfer knowledge to implement new routines or plans, through *transition*, which is used to support an agenda or a policy to *transformative*, which is used to develop new practices and cater for innovation. There is an expanding space for educator autonomy from the first to the last category.

The CLA model belongs to the last category. It provides educator autonomy, ideas for new practices and innovation. Rather than starting from institutional strategies and policy documents, it is also flexible and adaptive enough to handle educational challenges according to local needs and circumstances. An important feature is also that it allows for coordinated development and networking. Faculties at the same level can develop along the same path. In this sense, it also creates a developing micro-culture as discussed earlier, rather than a community of individuals, resilient to change, holding on to old solutions that are mostly obsolete.

In the CLA, developed in this project, the main motivating force was a collective process driven by the participants at the meso-level and their local mentors. Educators were free to explore and decide on what technologies to use and how to use these to enhance teaching and learning in the local setting. Contrary to top-down initiatives, this also supports the pedagogical variation and tailor-made solutions which are necessary in large heterogeneous organizations. Following the model, the teacher educators portrayed in this study became digital role models for their students, who returned to numerous schools with fresh ideas regarding digital learning.

Creating a community of learners at the meso-level was obviously useful in this study. The study was of a single case and, according to Kennedy (1979), findings in such studies can be transferred to other settings depending on contextual factors and the extent to which these are recognizable in new settings. It is up to the stakeholders and users in the new setting to decide if the similarities are there and sufficient to try out the solution. This is a kind of case validity that is also often discussed in medical or legal cases with similar symptoms or circumstances. A solution that solved one case might, if the the cases are similar enough, also be helpful in new cases (op. cit.). This also means that the CLA model developed in this study could be a valuable stepping stone in other cases of professional digital development where the local challenges are similar.

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An Analysis of Participants' Experiences from the First International MOOC Offered at the University of Oslo

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ABSTRACT

This paper explores pedagogical practices and participants' engagement in learning activities during the first international Massive Open Online Course (MOOC) offered by the University of Oslo through the FutureLearn platform in 2015. The data were collected using pre- and post-course surveys and participant observations. We used the acquisition and participation metaphors of learning proposed by Sfard (1998) as a conceptual framework to inform our analyses and discussions. The data indicated that new pedagogical practices are in the making for online learning, involving elements of existing practices and radically new ones. The instructors had sole authority in developing and curating course contents, thus following the acquisition metaphor of teaching and learning. In addition, the data indicated that, overall, the learners had a positive experience of learning by participating in the MOOC. The learners engaged in online discussion forums, interacting asynchronously with fellow learners and mentors. The discussion forums promoted knowledge sharing and collaborative learning activities among diverse groups (joiners, surveyors, and social learners). The apparent contradiction between teaching according to the acquisition metaphor and the learners' preferences for the participation metaphor was resolved by some of the learners through self-organised scaffolding. The teachers did not interact enough with the learners and so, to compensate, some learners took on facilitating roles. We discuss our findings in terms of the related work and contemporary trends in online learning and higher education research, including learning analytics, formative assessment, personalization, collaboration support, and lifelong learning.

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INTRODUCTION

Rooted in the ideal of openness in education, Massive Open Online Courses (MOOCs) have become a new instructional trend in higher education (HE) for engaging a large, diverse group of learners in online activities. Because of their flexibility, MOOCs have demonstrated in specific cases the coordinated efforts of "active engagement of several hundred to several thousands of learners who self-organise their participation according to their learning goals, prior knowledge and skills, and common interests" (McAuley et al., 2010, p. 5). Although the ultimate impact and sustainability of MOOCs are not yet known, these courses have gained popularity in the higher education (HE) sector since top universities from around the world began to embrace this model and to provide these courses free of charge. Arguably the biggest strength of MOOCs is their flexibility, as they provide opportunities for learning anytime and anywhere in formal and informal education, while one of the most frequently reported drawbacks is that they have high dropout rates (Breslow et al., 2013; Ho et al., 2014; Jordan, 2014) and require extensive preparation time. For example, in the MOOC analysed in this paper, there was a dropout rate of more than 90% of the students and it had 58 short videos prepared in advance (Singh, 2016).

MOOCs are one of the fastest growing technological developments in the education sector—they have grown by 10% since the launch of the first MOOC in 2008 (Toven-Lindsey, Rhoads & Lozano, 2015)—and offering a MOOC has been a matter of reputation and way of branding and marketing for many universities. MOOCs may prove to be an integral part of HE institutions in many parts of the world, but the size of the HE pie that MOOCs will claim is unknown and will likely be debated for a long time. Empirical research of the successes and failures of MOOCs is a promising direction for harnessing their potential as a source of teaching and learning, and we contribute with an empirical study from one of the Nordic countries.

MOOC developers have drawn a distinction between xMOOC and connectivist MOOCs (cMOOCs). In an xMOOC, online courses are built as an extension of the conventional campus course where the main distinction is with regards to the number of students who can enrol. Furthermore, xMOOCs are characterised by the learning resources they provide, which range from video lectures (a large number of short video tutorials on related topics), online reading materials, and automated assessment tools like quizzes (Kesim and Altınpulluk, 2015; Bates, 2014). However, the first MOOCs were initially envisioned as cMOOCs, a term coined by George Siemens and Stephen Downes in 2008 (Yuan & Powell, 2013). These initial MOOCs had a decentralised, network-based, nonlinear structure focused on exploration and conversation rather than fixed content and instruction (Margaryan, Bianco, & Littlejohn, 2015). In cMOOCs, each learner is responsible for his or her own learning process, which is enabled by his or her network of learners and their connections (Kesim & Altınpulluk, 2015). However, they turned out to be difficult to

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organise on the large scale compared to xMOOCs, which are easier to organise and deliver for a large group of learners.

The differences between the two types of MOOCs are under debate regarding their respective strengths and weaknesses. A common perception is that cMOOCs might be preferable from a learning perspective, while xMOOCs might be more scalable. Another helpful method for comparing the two types of MOOCs is Sfard's (1998) *acquisition metaphor* (AM) and *participation metaphor* (PM) of learning. The AM compares learning to a process of taking in or being supplied with ready-made knowledge from a more knowledgeable person through individual efforts, whereas the PM views learning as a process of taking part in various social practices and shared activities with fellow learners.

The main aim of this empirical paper is to explore and analyse the patterns of pedagogical practices and learning experiences in the first international MOOC offered by the University of Oslo in 2015. It has two research questions:

i. What are the pedagogical practices in the MOOC?
ii. What are the expeiriences of the MOOC participants, and what do they say about the teaching and learning practices in the MOOC?

The rest of the article is organised as follows: First, we present a literature review to identify key issues of teaching and learning in MOOCs, as seen from the AM and PM perspectives. Then we describe the case and introduces the research design and methods. After that we present quantitative and qualitative data followed by analyses. Then we answer the research questions, compare our findings with the findings reported in the literature, and discuss the possibilities and limitations of MOOCs in terms of some contemporary trends in online learning in higher education before we summarise the results of our research.

LITERATURE REVIEW

MOOCs are considered as an upgraded version of distance education enabled by the advancement of educational technology. Anderson & Dron (2011) divide distance education pedagogy into three categories: cognitive behaviourism, social constructivism, and connectivism. Cognitive behaviourism is defined as the pre-web period of printed materials, television and radio; social constructivism refers to the web 1.0 and teleconferences period; and connectivism refers to the communication and interaction process provided by web 2.0 and social networks. The authors argue that the classical learning theories are insufficient in that they were developed in an era in which technology was not as influential on education as it is today, and they promote connectivism (Anderson & Dron, 2011; Siemens, 2004). The learning process in connectivism takes place as learners adopt others and share their knowledge through making connections with the collective knowledge of the community (Siemens, 2004). Learning is not merely the transfer of knowledge from the teacher to the learner and does not take place in a single environment; knowledge is transformed and transferred through the interactions of people, especially in a web environment (Kop, 2011).

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Sfard (1998) argues that the major learning theories are based upon either the acquisition metaphor or the participation metaphor, which are not mutually exclusive categories but are complementary ways of thinking about the complexities of learning. The AM depicts learning as the acquisition and accumulation of knowledge, inherited from cognitive models that assume learning is a transmission of knowledge, and constructivist models that emphasise knowledge is not passively received but actively built on an individual's prior experiences. Knowledge from the AM perspective is considered a 'commodity' that can be acquired and therefore applied. Teachers are providers, facilitators and mediators of teaching and learning. Learners are consumers and learn by adaptation with the AM. Our preliminary observation is that the majority of MOOCs are, from the outset, grounded in the AM, as they are highly structured and solely designed by the teachers for consuming by a mass of learners. The assessment is more superficial and automated within a MOOC compared to a conventional campus course, and feedback on learning activities is minimal and part of summative rather than formative assessment. MOOCs based on the AM seem to be suitable for novice learners, as contents are presented in a carefully planned and sequenced manner (Singh, 2016).

The PM, on the hand, represents learning as an active involvement in an on-going process of learning together with others in a particular context. Learning is a process of becoming a contributing member in a community of learners. Learners enter the MOOC as peripheral participants and apprentices (Lave & Wenger, 1991) while teachers and more skilled learners are expert participants and preservers of a culture of participation (Fischer, 2011). In a nutshell, the AM focuses on outcome and the PM on process. Thus, Sfard suggests employing both metaphors in order to design for and understand learning in modern educational settings.

Paavola, Lipponen & Hakkarainen (2004) and Moen, Mørch & Paavola (2012) argue that Sfard's PM is restricted in its focus on collaborative learning activities and communal participation and tend to overlook the outcomes of learning. They instead proposed the knowledge creation perspective (KCM), which emphasises communal participation of developing shared objects of activity, thus taking into account both process and outcome (Paavola, Lipponen, & Hakkarainen, 2004). It is collaborative efforts towards learning that result in shared knowledge, which is more than the sum of individual efforts (Moen, Mørch, & Paavola, 2012). The diverse types of learners from different backgrounds in MOOCs have potentials for collaborative knowledge creation if their ideas are encouraged, taken up, synthesised, and applied by individuals.

Kovanovic et al. (2015) found that MOOCs have attracted unprecedented public involvement and interest compared to previous innovations in educational technology, but media coverage of MOOCs decreased by 50% from 2013 to 2014, though government interest in and use of *learning analytics* for enhancing MOOC learning experience are growing (Clow, 2013), and the quality of MOOC discussions is increasing in the literature. Sunar and colleagues (2015) examined 66 papers related to *personalization* of MOOCs and have found that there is a growing trend of researchers focusing on implementing personalization and adaptation tools in MOOCs to improve users' engagement and reduce the huge dropout rate. Researchers are paying attention to improve individual learning experiences in MOOCs through personalised learning paths, personalised assessment through *adap-*

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tive feedback, personalised forum thread and personalised learning materials and learning tasks (Andersen & Ponti, 2014; Sunar et al., 2015). These emerging themes will be brought up again later in the article when we discuss MOOCs in terms of contemporary trends in online learning.

In the same way as learning theories over time have created bridges across the individual and social learning gulf (e.g. as reflected in the syntheses of AM and PM), learning technologies show a similar trend, in our context manifest in the debate among xMOOC and cMOOC camps.

The cMOOC camp emphasises the connectivist approach with co-construction of knowledge as an integral part of learning (e.g. Andersen & Ponti, 2014), while xMOOCs advocate a more cognitive-behaviourist oriented approach with more focus on delivery of information and individual learning. They determine each a particular pedagogical approach. The cMOOCs are driven by the principles of pedagogy within a richly networked setting, aiming toward the social mode of learning, while xMOOCs are institutionally focused, overtly reliant on video lecture contents and automated assessment through quizzes, and characterised by pedagogy short on social contract (Bayne & Ross, 2014).

The recent literature is starting to move away from the simplistic binary categorization toward more nuanced and micro level discussions of what is happening in different kinds of MOOCs (Bayne & Ross, 2014). Therefore, some scholars like Waite et al. (2013) have proposed the notion of 'hybrid MOOC' or a process by which educators might mediate the dichotomy between xMOOCs and cMOOCs (Grunewald et al., 2013), embodying characteristics of both types of MOOCs, levering their strengths and inhibiting the weaknesses. However, up until now MOOCs have not improved the nature of individual learning and have only changed the form of social learning, yet do not address the type of learning needed in the 21st century (Bogost, 2013), which we argue requires the integration of learning theories as well as learning technologies. Particularly, the xMOOCs largely reproduce the banking model of education (e.g. Freire, 1970) through *readymade content*, including video lectures, digitised resources and automated assessment (Morris, 2014) and force students to "become passive, uncritical repository of teacher-owned knowledge" (Hai-Jew, 2014, p. 341). Pre-packaged instructional material does not promote active learning (Morris, 2014) and is not necessarily the best way for everyone to learn (Prensky, 2011). On the other hand, cMOOCs resist the banking model and provide the students with opportunities to direct their own learning experiences and to assist peers' learning as well (Howard, 2017), but put a very high burden on students to collaboratively create new understanding, such as co-creation of tasks (Andersen & Ponti, 2014), which arguably is better tuned to expert learners than novices, or at least a combination of expert and novice learners (Moen, Mørch & Paavola, 2012).

In a review of previous studies, Tømte, Fevolden & Aanstad (2017) have found two contrasting views on the emergence and development of MOOCs: "the global disruption view and national mediation view" (p. 211). The proponents of the first view see the MOOCs as innovation and competition drivers for HE. The proponents of the national mediation view see MOOCs as e-learning delivery and argue that national education authorities need to work on policies for adjusting MOOCs into countries' existing educational systems. This view has emerged as the dominant in Norway. A government appointed commission for

investigating the possibilities for adopting MOOCs into Norwegian higher education system found that the pace of digitalisation of HE in Norway has been slow and argues that MOOCs and new digital technologies can help develop Norwegian knowledge society. The main motivations for adopting MOOCs in Norwegian HE context are for strengthening quality, access, and marketing of Norwegian education and research, increase recruitment and cooperation, and reduce costs (Tømte et al, 2017).

There are different patterns of learner engagement in MOOCs, such as active participation, passive participation, lurking, dropping-in, etc., and these patterns keep changing (Hill, 2013; Milligan, Littlejohn & Margaryan, 2013). Simon Nelson (2014), CEO of the company FutureLearn, has characterised learner engagement patterns into six (overlapping) categories: joiners, learners, active learners, returning learners, fully participating learners, and social learners. Morris & Lambe (2014) have categorised MOOC participants into five types of learners: pre-university learners, university learners, professional learners, self-directed learners and leisure learners, according to different types of motivation for taking part in MOOCs.

The multiple ways of categorising MOOC learners can be attributed to different interpretation of MOOC dropout rates. On average, less than 10 % of the participants complete the MOOCs (Breslow et al., 2013; Waks, 2016). There are various reasons for learner dropouts such as: high workload, challenging course contents, lack of time, lack of pressure, lack of a sense of community, social influence, lengthy course start-up, and learning on demand (Hone & El Said, 2016; Zheng et al., 2015). The drop out is partly because of the "free factor," which might have attracted learners who wanted to give it a try, but were not committed to completing the MOOC. In some cases, learners can buy a certificate by paying for it without even completing the MOOC (Singh, 2016). However, Clow (2013) argues that learners' complete withdrawal from MOOCs may reflect self-directed learners' choices to "climb out" (rather than drop out), and this mirrors learners' variable level of activity over a MOOC's duration. The monolithic distinction between completers and dropout is inadequate for describing the diversity of learners' engagement patterns (Clow, 2013; Seaton et al., 2013). Concerning different ways of learning in MOOCs, Fasihuddin et al. (2015) propose a framework to personalise open learning environments based on the theory of learning styles, particularly on Felder and Silverman's (1988) learning style model. The framework provides adaptive navigational support through sorting and hiding the learning materials based on learners' learning styles and the involved preferences.

DESCRIPTION OF THE MOOC

A course titled "What Works: Promising Practices in International Development" was the maiden MOOC that the University of Oslo offered through the FutureLearn platform in 2015. It was Norway's first online class open to the whole world (Ottersen, 2015). The course was developed by the University of Oslo's Centre for Development and the Environment in close collaboration with Stanford University, the University of Malawi's Chancellor College in Malawi, China Agricultural University in Beijing and the Norwegian Agency for Development Cooperation. The interdisciplinary researchers, scholars and development specialists from the collaborating universities and organizations contributed to video lec-

tures, reading materials, quizzes and so on for the six-week course. The University of Oslo's Centre for Information Technology (USIT) provided technical support in creating and delivering the MOOC through FutureLearn.

About 7,000 participants from 268 locations throughout the world signed up for the MOOC. In fact, participants continued to enrol in the course even after it was over. The majority of the participants were female (66%). The age group of 26 to 35-years old was the most prominent (37%). About 49% of the participants were full-time workers, and 18% were enrolled in full-time education. Most of the participants (about 81%) had university degrees.

The data extracted from the post-course survey show that more than 67% of the learners found the structure of the course to be very clear. For 34% learners, it was fairly clear. Through observation, it was easy to identify that the course contained different topics related to developmental studies, including development, governance, and democracy. The instructors, each coming from one of the collaborating institutions, provided the various course components, i.e. video lectures, suggested reading materials, quizzes, discussion/reflection/feedback forums, one assignment and two videoconferences. Course materials and activities were delivered weekly so that learners could complete them as flexibly as possible.
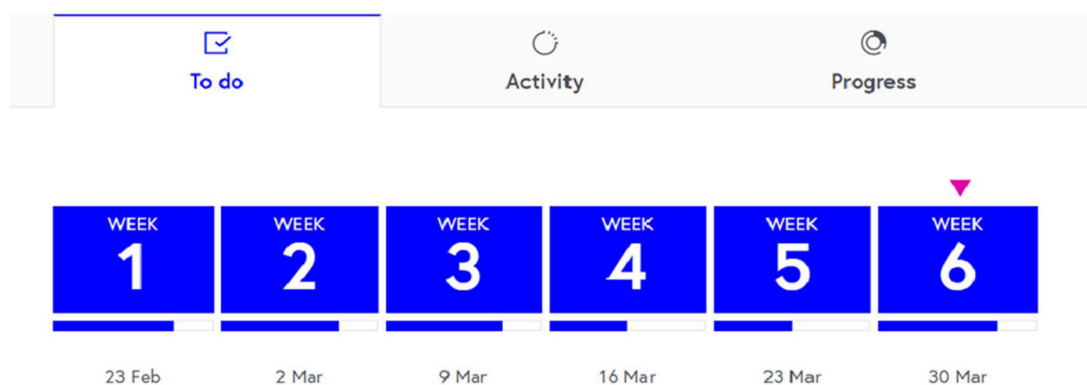

Figure 1. Dashboard for viewing and navigating the course contents (*top*) and weekly course schedule (containing activities and steps for learning) at *bottom*.

The MOOC has a dashboard user interface to view and access the different functions offered (Figure 1): To Do, Activity, Replies and Progress. The To Do icon was used to navigate course content, the Activity icon was the archive of the learner's posts, and Progress showed how much of the course had been completed. The dates underneath each week indicated when the course content was delivered on the platform.

The course was organised by a number of instructors and mentors. The instructors were university professors and teachers, and international development specialists, whereas the mentors were master's students, a learning designer, a lecturer and a professor who facilitated the teaching and learning. The instructors did not directly interact with the learners. Automated quizzes and peer assessments were used to gauge the understanding and performance of the learners. In the final week, only one participant who participated on the post-course survey reported that he peer-reviewed an assessment, whereas others did not

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mention it. So, it was hard to determine how many learners submitted their assessments and received peer reviews. The mentors notified those who submitted assignments by email after they had been reviewed. FutureLearn provided a 250-word space for learners to leave comments and suggestions in response to the assessments. In addition, there were two online videoconferences offered on the Talkabout platform.

DATA COLLECTION TECHNIQUES

The researchers employed a mixed-methods research (MMR) approach by integrating different methods from two research paradigms: quantitative and qualitative (Creswell, 2009). In MMR, "the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study" (Johnson & Onwuegbuzie, 2004, pp. 17–18). Pre- and post-course surveys as a source of quantitative data, and participant observation as a source of qualitative data were used to explore the pedagogical practices and learners' experiences in the MOOC. The design for data mixing that was adopted was the explanatory or sequential mixed-methods design (Teddlie, 2004; Creswell, 2009). In this design, one type of data (e.g., QUAN) provides a basis for the collection of another type of data (e.g., QUAL) and answers one type of question (here, QUAN) by collecting and analysing two types of data (QUAL and QUAN). Inferences are drawn from the analysis of both types of data.

The researcher (first author) received access to the quantitative pre-course survey questions from the USIT first, but the decision was made to prioritise the qualitative data collection and analysis despite it being the second phase of the research process. This decision was influenced by the purpose of the study to explore and explain pedagogical practices and factors that affected the participants' engagement in the MOOC. Based upon the pre-course survey questions, a thematic analysis thematic analysis (Creswell, 2009) of the comments that participants left on different discussion forums was carried out. Each comment was coded using a range of analytic concepts and content descriptors: supportive, critical, expectation, motivating, demotivating, etc., and as advanced, average, etc., according to different themes of different questions and carried out in an iterative fashion (from lower to higher level codes).

The researcher obtained the survey data from the USIT at the end of the course. The nature of the pre-course survey data was predictive, while the nature of post-course survey data was descriptive and explanatory. The themes of the qualitative data were reviewed following the analysis of the post-course survey data to ensure that no important theme was overlooked. The number of participants who responded to the pre-course survey was much higher than the post-course survey as a result of the high dropout. As stated previously, qualitative data were used to the quantitative data.

Pre- and Post-Course Surveys

The surveys were developed and delivered by the course provider. The USIT supplied the researcher with the data. The pre-course survey data were used to decipher learner demographics in terms of *gender, education level, employment status, participation, expectations, preferred ways of learning* and *perceptions*. The post-course survey data were used

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to explore how learners learned and what challenges or difficulties they faced during the 6-week course. Out of the approximately 7,000 course registrants, 936 learners filled out the pre-course survey, while only 38 replied to the post-course survey. Other items, like *pedagogical practices, course structure, course design and contents, factors promoting and hindering learner participation in the course, learners' preferred ways of learning, learner dropouts*, etc., were drawn from the post-course data. Since there was a significant variation in the response rate between the two surveys, the data were used to generate understanding, not for any comparative analysis.

Participant Observation

Participant observation (PO) is "engaging with people in as many different situations as possible" (Hammersely & Atkinson, 1995, p. 65). The researcher for this study enrolled in the course and introduced himself to his peers as an observer of their learning activities for research purposes. PO helped the researcher gain an understanding of physical, social, cultural and economic contexts of the learners. An observation log, which contained a checklist for coding learners' comments and views on *course structure, quality and design of course contents, experiences of engagement, factors promoting and hindering learner participation* and *nature of interactions*, was used to keep track of observed comments. The researcher's role as a moderate participant during the course changed into a complete observer after the course was over because of the massive amount of data to comb through. This unobtrusive and prolonged engagement in the collection of data helped to minimise bias (Onwuegbuzie & Leech, 2007). The data were observed for 3 months, for approximately 5 hours each week by the first author.
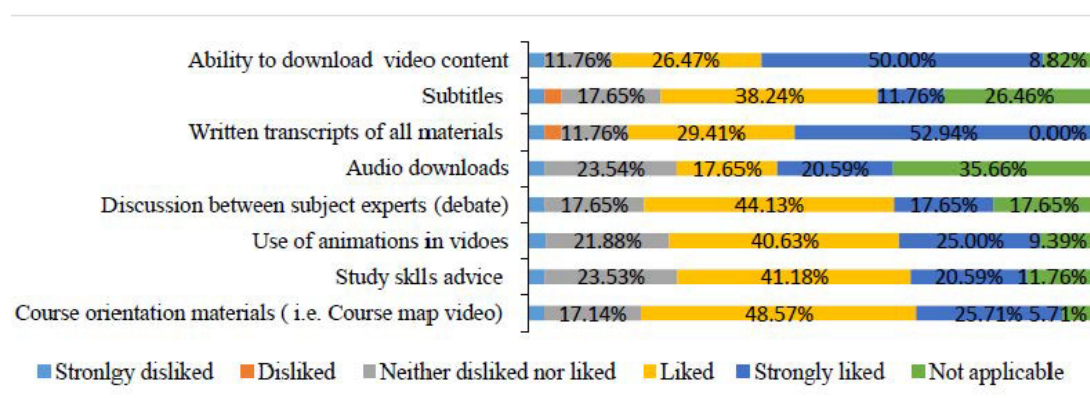
DATA AND ANALYSIS

Both the survey and observation data focused on recurring themes, and we identified the following six themes thorough thematic analysis though thematic analysis (Creswell, 2009) of the data by two researchers: quality of course design and course content; learner engagement; expectations of the MOOC; learning preferences; learner dropouts; nature of interactions among participants. The themes are presented sequentially, and for each theme first the results of surveys are presented and then instances of participant observation data provide supplementary evidence. The two data sets are analysed together to elaborate the aforementioned themes. When relevant we compare our findings with findings reported in the literature we have surveyed.

Quality of Course Design and Course Content

Data from the post-course survey showed that the majority of the learners (76%) found the level of the course to be about right, about 9% found it a bit advanced, 3% found it to be much too advanced and 12% found it to be a bit too basic. Concerning course design and content (Table 1), the majority of the learners liked the course content, materials, debates, animation videos, etc.

Table 1. Learners' perceptions of course design and contents (N=35)

	Stronlgy disliked	Disliked	Neither disliked nor liked	Liked	Strongly liked	Not applicable
Ability to download video content			11.76%	26.47%	50.00%	8.82%
Subtitles		17.65%		38.24%	11.76%	26.46%
Written transcripts of all materials		11.76%		29.41%	52.94%	0.00%
Audio downloads			23.54%	17.65%	20.59%	35.66%
Discussion between subject experts (debate)		17.65%		44.13%	17.65%	17.65%
Use of animations in vidoes			21.88%	40.63%	25.00%	9.39%
Study sklls advice			23.53%	41.18%	20.59%	11.76%
Course orientation materials (i.e. Course map video)			17.14%	48.57%	25.71%	5.71%

Data obtained through observation indicated that the majority of the learners appreciated the course design and course content. They found them insightful, thought provoking and academically challenging. However, some learners felt that the content was not explained well, and a few learners perceived the course content to be propaganda (i.e., applying a western perspective to solve all issues related to development). In addition, some learners with hearing impairments had difficulty understanding the course content because of a lack of subtitles.

At the end of the course, sixty-six participants left their comments regarding the course design and contents. Fifty-five participants felt good about the course. The following statement of P1 explains how the majority of the participants felt about course design and contents:

> P1: It was not just the content of the course but also the teaching process that I appreciated. I liked the way that often we, the learners, were first encouraged to give our views on some ideas as to what would work before hearing from someone on the ground who described what had happened and then being given access to papers with a deep analysis of the issues and the evidence. I had my prejudices challenged (and even overturned!) by this process. While there were aspects that I would have liked to know more about, such as the possibility of development and capacity building even at a time of war/conflict, I recognize this was a six-week course. Thank you.

The above statement by P1 indicates that instructors encouraged the learners to share their views on different topics and issues and before they hear from someone on the ground how such issues had been dealt with. Such an approach helped to connect theoretical ideas with practical experiences and provided learners with insights into what really works on the ground. Learners' biases got challenged. However, some of the issues were less well explained due to time constraints.

Learner Engagement

Learner engagement in the course was influenced by the student's perception of the course content, pedagogical practices, individual experiences, time, peer group, etc. A larger population of learners engaged in the discussion/reflection forums than in the forums integrated with video lectures. This suggests that the participants preferred learning through

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reflection and discussion. As indicated by the post-course survey data, about 57% of the learners spent 30 to 60 minutes on the course each time they participated. The majority of the learners (about 84%) found the teachers very engaged in the teaching process. About 78% of the learners had a positive experience, and only about 6% of the learners found the course to be very poor.

However, the data obtained through observation showed that the majority of the learners engaged in the discussion/reflection forums, although learner participation was unevenly spread during the course period. The data in Table 2 derived from observation of learners' comments in the different forums show that learner participation dropped dramatically by week 4 (2/3 along), which is in line with previous findings (Breslow et al., 2013; Ho et al., 2014; Jordan, 2014).

Table 2. Learner dropout by number of comments the learners posted on the forums
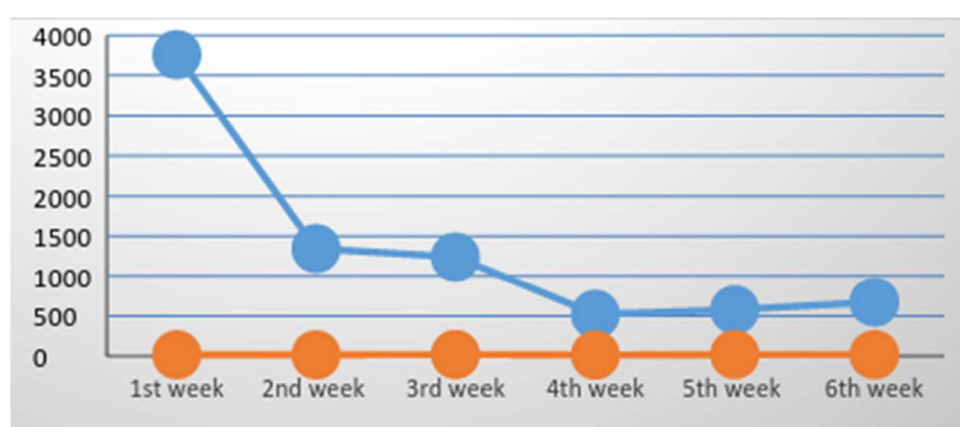
The following statements from P6 and P25 are illustrative of how many participants felt about their engagement with the course.

> P6: Thank you very much for the course. I thoroughly enjoyed participating (albeit late) and appreciate the contributions of all those involved. You have opened my eyes to new initiatives and practices that I previously knew nothing about, and also gave a multitude of perspectives, which helped give more of a 'complete' view of the situation. Many thanks
>
> P25: Thank you for the course, I have learnt a lot. It wasn't what I was expecting, I thought it would be videos of case studies in various countries, as I have experienced in other courses. It was more academic and more challenging. The production levels were high and there were some truly superb lectures. The only part I didn't really enjoy was week 2. I wonder if you lost anyone that week? I have discovered a prejudice in myself: I would prefer to have received lectures on democracy from someone from Norway than someone from USA. I think putting Rule of Law as week two gave it too much emphasis, part of a week would have been enough for me, especially as the subject was returned to in week 6. It was also interesting to read the views and experiences from learners all over the world, thank you. I enjoyed doing the assignment, though so far I have only had one review, I hope I will get another. I enjoyed reading the assignments of others. The interview with Dr Gro Harlem Brundtland was an uplifting finale.

The quotes of the two participants imply that they thoroughly enjoyed participating in the course. Some of the learners joined the course late and found contents more subjective, often biased. They liked to hear fellow learners' views and experiences from different parts of the world. They enjoyed hearing a resource person's views, which might have encouraged many of them to continue the course.

The literature indicates that there are different patterns of learner engagement in different MOOCs: lurkers, drop-ins, passive participants and active participants (Hill, 2013; Milligan, Littlejohn, & Margaryan, 2013). Clow (2013) observed four FutureLearn MOOCs and found seven distinct patterns of learner engagement: samplers, strong starters, returners, midway dropouts, nearly there, later completers and keen completers. They noted that these patterns of engagement were influenced by pedagogical decisions.

Based upon their activities, Nelson (2014) grouped learners on the FutureLearn platform into six categories: joiners, learners, active learners, returning learners, fully participating learners, and social learners. These overlapping categorisations can be simplified into three main categories, namely joiners, surveyors and social learners, which we illustrate with our data.

The joiners were the largest category in this course. Joiners are the subset of those enrolled who actually introduced themselves to their peers and mentors. The course provider reported that 7,000 learners signed up for the course, but only 936 responded to the pre-course survey and actually joined the course and only 955 introduced themselves to their peers and mentors. Some of the joiners sometimes liked the course content, but did not take active part in interactions with others.

The surveyors were those who went through all course content and examined the video lectures and read comments. If they found something interesting, they engaged in interactions with peers and mentors; otherwise, they just read the postings. The number of joiners slowly decreased, which implies that they became surveyors. Furthermore, when learners joined the course late, they became surveyors because they were not able to fully understand the course content. These learners would engage in some activities, skip some and then come back later.

Finally, the *social learners* were those who posted, viewed and learned from comments. The learners who responded to the post-course surveys (total 38) can be regarded as social learners because they responded to all questions concerning the course content and their engagement in the course was high. However, the actual number of social learners varied according to the different topics presented in the course. In the first week, about 200 learners engaged in all content, but this number decreased to about 50 learners in the last week. These learners also took part in the videoconferences, wrote blog posts and shared with peers. They also created their own videos based on their own experiences concerning different issues of development and poverty reduction.

Expectations from the MOOC

The pre-course data (Table 3) indicate that the majority of the learners (70%) expected to learn something new, while about 42% expected to add a fresh perspective to their current work and about 43% expected to improve their career prospects. Similarly, learners were motivated to join the course to gain extracurricular skills, to prepare them for further stud-

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ies, because of the course flexibility, because they wanted to try online learning, to interact with other people, etc. The post-course data showed that more than 65% of the respondents met their expectations of learning flexibly and interacting with other people. About 56% met their expectation of supplementing their existing studies. Similarly, the course helped 49% add a fresh perspective to their current roles and improve their career prospects. This shows that the expectations from the MOOC were sustained or increased for those who completed the course.

Table 3. Learners' expectations of the course (N=936)
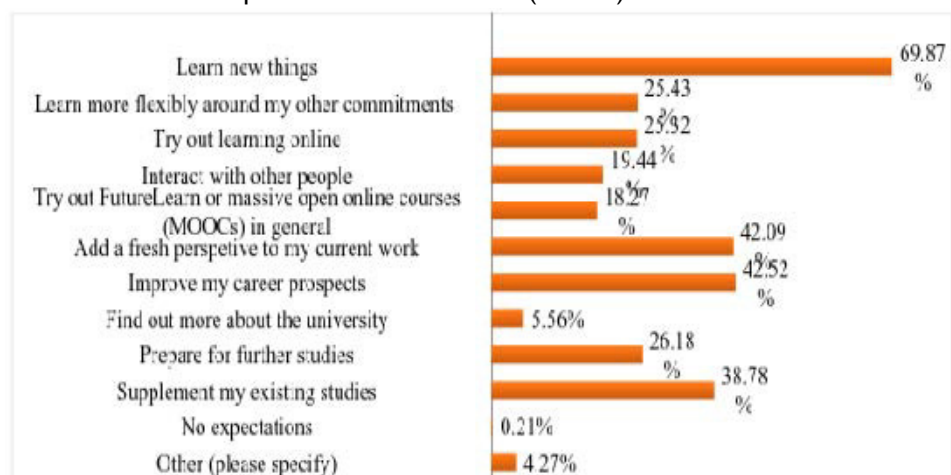
Learners with different levels of education, age range, employment status, etc., had different motivations and expectations for participating in the MOOC. The following statements from four participants reflect an attitude that different learners from different background had different expectations of the course:

> P7: Hi there all. I am from South Africa and I am working for an international NGO focusing on housing solutions. I am very keen to be exposed to broad perspectives on good practice that have shown success in different contexts.
>
> P8: Hi everybody. I am from Germany, have a PhD in Medical Research and work for over 20 years in HealthCare in different disease areas (currently cardiovascular) on global positions. Non-communicable diseases are some of the most increasing disease areas – yes, also in developing countries! Just have a look at: http://rabinmartin.com/report/noncommunicable-diseases-in-the-developing-world-addressing-gaps-in-global-policy-and-research/ And I'm always interested to learn about critical factors, that make the difference between success and failure!
>
> P10: Hi! My name is … and I'm from Oslo, Norway. I'm a political scientist who have lived, studied and travelled extensively in southern Africa. Currently I'm interning for an NGO in Kampala, Uganda – my first time in east Africa! I'm passionate about some aspects of international development, however, I'm also extremely critical of international development aid. I've signed up for this course to learn more about the subject and to learn about/critically discuss various approaches.
>
> P12: …I am excited to learn about what really works, and not at least why it works. I can really see myself work in a NGO (UNICEF, UNESCO) or Norad after graduation in october this year.

The above statements from different participants and the quantitative data shown in Table 3 show that different learners had different expectations of the course.

Morris & Lambe (2014) suggested that expectations vary according to type of learners, distinguishing among pre-university learners, university learners, professional learners, self-directed learners, and leisure learners. The pre-university learners want to increase their understanding of a current subject; university learners also increase their understanding of a current subject and explore potential areas for further study. Professional learners want to gain competences and skills to improve their career prospects, and add fresh perspectives to their current work. Self-directed learners want to gain knowledge and understanding of new subject areas, or build and expand a professional network based on personal interest. The leisure learners want to satisfy their curiosity and support the professional community.

Learning Preferences

Learning preferences refer to an individual learner's habitual ways of processing and acquiring information, and data from learning preferences are shown in Table 4.

Table 4. *Left*: Learning preferences prior to the course start (N=920), and *Right*: learners' preferred ways of learning (post-course) (N=35)
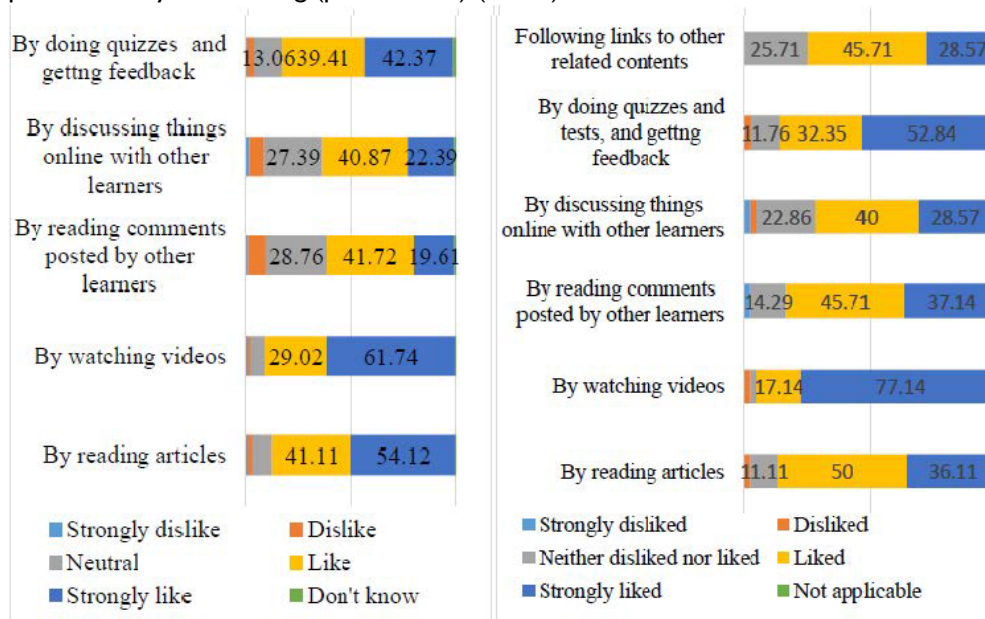
Data from the surveys show that the majority of learners preferred learning by watching video lectures and taking quizzes. Around 50% of the learners liked to learn by reading the comments posted by fellow learners, by following links to other related contents, and by discussing matters online with fellow learners.

Personal comments indicate in more detail what preferences learners had regarding learning, which include the role of collaboration and reading commentaries of videos for learning, as shown in the following online conversation by three participants.

P23: Thank you so much all of classmates who collaborated to improve my knowledge. It is greatly appreciated.

P24: would be great if all the videos have translations/word version. nice lessons. just wondering how citizen fora has worked in other developing countries especially ….

P29:   http://blog.riverford.co.uk/2015/03/06/guys-newsletter-unruly-cabbages-the-last-stand/ …, you may find this blog on seeds, from an English organic farmer, interesting.

As indicated by the above statements, the learners engaged in a wide variety of participatory activities such as knowledge sharing, commenting on video lectures, posting counter arguments on fellow learners' views and perspectives, sharing their views through their personal blogs, reading transcripts, reading suggested reading materials, etc. Such activities promoted active and collaborative learning practices in the MOOC.

There were different ways for the participants to learn in the MOOC. Watching videos or reading the related transcripts was the only way for acquiring the actual information from the course. In addition, there was a separate forum for reflection activities, where learners were encouraged to create their own blog posts and videos and share them with peers.

Felder and Silverman's (1988) categorization of learners on the basis of how they process and acquire information proposes four types of learning preferences: sensory or intuitive; visual or auditory; active or reflective, and sequential or global. Sensory learners prefer learning by example and practice, while intuitive learners prefer meaning and theories; visual learners learn through pictures, diagrams, and films, while auditory learners prefer learning by written and spoken explanations; active learners prefer to work with others and create things, while reflective learners prefer thinking and working alone; and sequential learners prefer learning in an orderly and linear manner, while global learners prefer to learn holistically. From our data we can say that learners who preferred to watch videos and read the related transcripts can be termed visual-auditory learners or sequential-holistic learners. The learners who prefer to engage with peers and mentors in the discussion forums can be termed as active-reflective learners.

Learner Dropouts

A few learners responded to the post-course survey question on what factors hindered them from participating in the course. They could choose from lack of time, lack of motivation/interest, lack of pace as the course progressed, difficulty in using the platform, different learning environment, poor internet connection, and joining the course just for curiosity.

The following statements of three different participants indicate different contributing factors for learner dropouts:

P3: (an English teacher): …I think there are two factors behind that. Firstly, some parts of the course especially week1 and some of the …Chinese contributions were perceived by many as propaganda … I think it alienated quite a lot of students. In future the tone of some lectures could be softened.

Secondly, language has been a barrier. The lectures have been longer, denser and linguistically far more demanding than other FutureLearn courses I have done. Personally, I appreciate the extra rigor and have got a lot out of this course. But I think the team overestimated the Eng-

lish level of many students. In one of the assignments I reviewed the writer was completely out of his depth with the topic in English and so was one of those who reviewed my article. I[n] future it might help to include subtitles in the videos or connect the comments forums to a translation website so that people could write in their native language if necessary

P16: For me, not having a transcript is more than an inconvenience. My hearing is not good so this possibly amounts to discrimination. I have completed several of these Future Learn courses but I've never met with a straight, though apologetic 'no' before. Transcripts might have been late in coming but they came eventually. This is a great disappointment.

P7: Hello, my internet connection is not the best I would love you attach the transcript of each video so that we can download and read in case of poor internet connection

Through observation, three other reasons were also found, namely internet quality, lack of time and a lack of transcripts for some of the lecture videos. For a few participants, an important factor hindering their participation was a lack of English language proficiency. These learners asked for the transcripts for each video, and the mentors tried their best to supply these transcripts as fast as possible. When there was a delay, fellow learners also made transcripts for some of the videos and shared them with their peers. The fact that the course was free may have also contributed to dropout because the learners were not fully invested in completing the course.

Many of these reasons for dropout have been noted in previous research (Hone & El Said, 2016; Zheng et al., 2015). However, dropping out should be viewed as just one of many activities that self-directed learners engage in (Clow, 2013). The monolithic distinction between completers and dropout is inadequate for describing the diversity of learners' engagement patterns (Clow, 2013; Seaton et al., 2013), and the dropouts may have already achieved their aim of learning about a particular concept before they completed all parts of the course. They may just have been surveyors of the course contents.

Nature of Interactions Among Participants

The post-course survey data showed that the majority of the learners (84%) found the mentors to be very engaging. Through observation it was found that only mentors and learners took part in the comment/discussion/reflection/feedback forums, not the instructors. The observed interactions were between mentors and learners, and between learners and learners. The mentors would read the learners' posts and then post replies. Their role was to balance the viewpoints among participants. Interactions between learners were much more frequent than between learners and mentors. The mentors tried to motivate the learners to watch the videos, read the suggested material, take quizzes and interact with fellow learners. Fellow learners answered many of the other learners' questions in the discussion forums. As stated previously, learners even provided English subtitles to some of the video lectures. As the course progressed, the instructors seemed to be out of touch with the learners' activities as they only appeared on the lecture videos and videoconferences. This can be compared to the idea in scaffolding of a teacher fading away from the educational activities as the learners gradually become independent. The lack of actively engaged teachers in the whole learning process—what we take for granted in conventional teaching—may have actually discouraged some of the learners from

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remaining in the course. On the other hand, the learner community provided an alternative, which we present next.

Discussion forums integrated with each section of the course were the main tools for interacting, and hence learning, during the MOOC. Interaction was supported both synchronously and asynchronously: the host organised videoconferences and the conversations in the discussion forums were asynchronous. The learners engaged intensively in asynchronous conversations and made use of social networking services outside of the platform, such as Facebook and Twitter, to share content to self-organise the required scaffolding. This can be seen as a process of collaborative learning (Ludvigsen & Mørch, 2010), which was one of the aims of running the MOOC. Future work should explore how to best stimulate collaborative learning on a broader scale, and we discuss some of the issues related to this in the next section.

General Discussion

In this section we answer and discuss our research questions, which have two parts, pedagogical practices and learners' experiences from the MOOC. In addition, we identify some emergent trends in technology development with implications for MOOCs, and we discuss alternative directions MOOCs can take in future higher education.

Pedagogical Practices

Five key pedagogical features characterise the MOOC we have studied: video lectures, reading materials, e-assessment, discussion forums and videoconferences. The proper sequence was first to provide the contents of teaching and learning to the participants and then encourage them to discuss the materials by collaborating with peers. The course structure, course content and learning activities in the MOOC were solely designed and created by the instructors in advance. The video lectures and reading materials suggested by the instructors were the primary sources of knowledge, and discussion forums were the major sources of interaction and collaborative learning. The task of interacting with students was left to the mentors who explained concepts, clarified misconceptions, and helped learners acquire knowledge. Therefore, the MOOC resembled both an xMOOC and a cMOOC, but it was found to be much closer to an xMOOC than a cMOOC. The concepts of the banking model of teaching (Freire, 1970) and the acquisition metaphor of learning (Sfard, 1998) can partly explain this; they are based on the idea that the human brain is a container and the learning process fills the container with content. The course included video lectures, reading material and peer comments for accumulating facts and acquiring knowledge. The video lectures were the primary method of transmitting information, and the automated quizzes were the main tool for assessment. Thus, the MOOC was acquisition oriented at the outset, as the instructors' role was to develop and deliver highly structured course content.

However, the learners did enjoy the video lectures, which suggests that they wanted to acquire as much knowledge as possible. They became consumers of the knowledge communicated through the platform. Automated quizzes assessed the basic facts, such as 'Income inequality has been increasing in Latin America since 2002' (True or False)'. The whole process was directed towards helping the learners acquire as much knowledge as

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possible about what works in international development programs. Some researchers argue that even though videos can be watched multiple times at the learner's own pace, it is not necessarily the best way for every person to learn (Prensky, 2011), and pre-packaged instructional content does not promote active learning (Morris, 2014). In a very large MOOC with thousands of participants, it is hard to pay attention to the individual needs, and a reliance on automated testing will likely push MOOC providers further into the banking model of education and force students to 'become passive, uncritical repository of teacher-owned knowledge' (Hai-Jew, 2014, p. 341). This increases the "danger of the relegation of education to a mere exercise of technology" (Freire, 1970, p. 75). However, technology also provides new solutions to the shortcomings associated with very large MOOCs, which have many participants with individual needs. We address this later.

Learners' Experiences of Participation

The MOOC brought a global learner cohort together for information or knowledge sharing, connection and interaction, and created opportunities for collaborative learning through discussion forums. A large number of learners engaged in the forums, which were the only method used to activate the learners in the course content, apart from two video-conferences stimulating to debate. The discussion forums were the spaces and tools that brought geographically scattered learners together and encouraged them to build a community of learners and a culture of participation (Fischer, 2011). The interactions that took place in the forums were asynchronous, so the learners had more time for flexible communication, e.g. thinking about what to say compared to face-to-face interactions. The forums were also the only way for promoting collaborative learning practices (Ludvigsen & Mørch, 2010).

However, synchronous communication by two videoconferences complemented the discussion forums and helped learners directly discuss the issues with the mentors and fellow learners. This whole process can be seen as an attempt at enculturation into a *community of practice* (Lave & Wenger, 1991; Wegner & Nückles, 2015), but, as discussed below, there was a high dropout rate in this course, which indicates that for some, the MOOC was more of a *community of interest* (Fischer, 2001), which consists of people who come from different communities of practice (e.g., different professions) and who may not want to complete a course or become a skilled practitioner in a field, but rather want to gain knowledge about one or more sub-themes of the course that are of particular interest (Fischer, 2001) in order to promote a self-directed type of learning (Clow, 2013; Morris & Lambe, 2014).

In these online communities, newcomers often enrol without long-term expectations; for example, they might want to find the answer to a question or the solution to a problem, and once they have achieved this goal, they leave the community. A community of interest is therefore an assembly of people brought together to exchange critical information, obtain answers to personal questions or problems, to improve their understanding of a subject, to share common passions or to engage in a hobby or activity (Fischer, 2001). Thus, the MOOC seemed to enrol members in a community of practice as well as multiple communities of interest. Further work ought to study this preliminary hypothesis in more detail.

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The High Dropout Rates

The MOOC in this study had a high dropout rate. The data show that the main causes for the steep dropout rate were lack of time, lack of motivation or interests, poor internet quality, lack of proficiency in English, some of the course contents being perceived as western propaganda, and dense or fuzzy videos. The course may not have catered to the needs of a diverse group of learners, but learner completion and dropout rates need to be seen as a part of a process of becoming social learners. The learners' withdrawal from the MOOC may reflect a self-directed choice to climb out (rather than dropout), which mirrors these learners' varying levels of participation in the MOOC (Clow, 2013). In addition, the kind of pedagogical practices prevalent in the MOOC, which were more in line with the AM than the PM, did not seem to promote learner-centred practices.

Approaches belonging to the PM typically emphasise communities, social practices, collaborative activities and the situated nature of human cognition and knowledge. Future-Learn's approach of bringing together different institutions, scholars and experts from all over the world to develop and deliver course content may result in enhanced institutional and teacher collaboration and community building among teachers. However, whether such online courses can also help learners build a community remains to be seen.

Connecting, interacting and sharing across diverse cultures (Fischer, 2011), attitudes and skill sets in a MOOC (McAuley et al., 2010) may not necessarily promote collaborative learning, as learners from diverse locations and cultures may not feel ready for collaboration. Therefore, course organisers should clearly state the aim of enculturation, namely, for students to progress from novice and peripheral participants to advanced practitioners in a community of practice (Lave & Wenger, 1991), or to help professionals find answers to specific problems by participating in a community of interest (Fischer, 2001).

The KCM

Paavola & Hakkarainen (2005) and Moen, Mørch & Paavola (2012) argue that Sfard's (1998) AM and PM have limitations because they only represent the monological and dialogical approaches to knowledge and learning and lack the 'trialogical' approach, which refers to "learning as a process of knowledge creation which concentrates on mediated processes where common objects of activity are developed collaboratively" (Paavola & Hakkarainen, 2005, p. 535). The trialogical approach and KCM focuses on understanding the processes of collective knowledge advancement that are important in a knowledge society. This metaphor goes beyond the two basic metaphors (AM and PM). It posits that individuals participate in collaborative learning activities in a community of learners, which allows them, in some situations, to acquire individual knowledge and, in other situations, to create new knowledge that is usable for the community at large (Moen, Mørch, & Paavola, 2012). Learners in this MOOC were encouraged to create their own videos and post them on the discussion forum. They were also told to write their own blog posts and share them with fellow learners. However, these were individual efforts rather than collaborative group work because the responses to students' creations (videos and blogs) were few and not meant for engaging in collaborative knowledge creation. This indicates an area for further work—promoting collaborative knowledge creation in MOOCs through sustained efforts at building on each other's videos and blog posts.

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MOOCs and Trends in Online Learning

Four trends in technology development in online learning address some of the shortcomings of MOOCs cited above: learning analytics; formative assessment by new forms of feedback; personalization, and collaboration support. They can help to increase collaboration, stimulate sustained engagement, suggest new models of course preparation, detecting dropout and providing countermeasures, while leveraging strengths such as flexibility of learning and scaling up delivery of instructional material.

Learning analytics (LA) is a new interdisciplinary field that takes advantage of learning activities captured and stored within digital learning environments such as MOOCs and can 'mine' and analyze these digital traces (log data) to identify patterns of learning behaviour and provide insights into learning practices (Gašević, Dawson & Siemens, 2015), including identifying potential dropouts of a course based on predictive modelling. By using visualization techniques, LA can provide instructors and mentors with overviews of learners' activities with educational resources in large online communities to help them cope with management issues as enrolment arises. Social learning analytics can visualise communication links between participants in collaborative learning activities, identify outliers in a community, and measure collaborative activity using social network analysis (Ferguson & Shum, 2012).

Formative assessment by new forms of feedback is found to be particularly effective in promoting learning, because good feedback encourages evaluation of an educational activity and provides information on both teaching and learning (Black & William, 2009; Gamlem & Smith, 2013). However, formative assessment is a thorny issue in MOOCs because it takes a long time for a small group of teachers to provide individualised feedback in a large community. Alternative methods have been proposed, such as peer feedback and adaptive (automated) feedback. Peer feedback was observed in our study through self-organised scaffolding, but to the best of our knowledge it was not organised as such by the course organisers. To improve students' learning further, teachers and educational technologies will need to embed feedback much more actively in learning activities. Data generated through learning activities such as solving a quiz to determine prior knowledge and writing an essay to demonstrate new skills according to a learning goal are prime data sources for adaptive feedback systems (Engeness & Mørch, 2016).

Personalization is a research focus in order to improve users' engagement and to reduce huge dropout rates (Sunar et al., 2015). A promising direction in personalization research is personalised learning materials and learning tasks. Andersen & Ponti (2014) investigated participants' co-creation of tasks in cMOOCs and what opportunities and challenges emerge. The authors identified and studied how peers can be part of creating course content and suggest offloading some of the teachers' work in course preparation onto students by co-creating course assignments, which they refer to as mutual development of tasks (Andersen & Ponti, 2014).

Collaboration support is another solution to making learning more engaging, as computer supported collaborative learning can support 21st century skills (Ludvigsen & Mørch, 2010). Furthermore, when asynchronous technology is supplemented by synchronous technology beyond video conferencing, new forms of learning environments that can stimulate sustained engagement become possible. This includes 3D virtual worlds, virtual real-

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ity (VR) and augmented reality (AR) (Caruso, Mørch, Thomassen, Hartley, & Ludlow, 2014). We expect in the future to see hybrid cMOOCs, which support both modes of interaction with fellow learners, teachers and instructional materials, where individual learners are switching between synchronous and asynchronous modes of interaction according to small group preferences.

Role of MOOCs in Higher Education

MOOCs can bring global learner cohorts together for information or knowledge sharing, connection and interaction, and open up opportunities to foster directed learning. Additionally, MOOCs can be useful digital resources for referential learning, and promote a life-long learning culture by extending the reach and access to educational opportunities. Furthermore, they can bring different higher education institutions together from all over the world, with different scholars and experts for delivering the course contents, which can strengthen institutional collaboration for innovating online pedagogy and learning activities. Collaboration among different institutions and instructors also contributes to new forms of researcher exchanges and effective development of teachers' dispositions, knowledge and skills, which in turn may result in creation of better teaching and learning materials.

In addition, Yuan & Powell (2013) argue that MOOCs can positively impact HE in two different ways: "improving teaching; and encouraging institutions to develop distinctive missions that will include considerations about openness and access for different groups of students" (pp.17–18). However, video-based learning in the MOOC, which characterises xMOOCs, may not result in meaningful learning (Morris, 2014) because the current format of MOOCs promotes the banking model of education, which might be suitable for learning in the knowledge domain, which can be mastered through repetitive practice as in many courses in undergraduate education. Thus, we may see in the future a branching in HE among institutions that focus on distance education and courses delivered as MOOCs for lower degree students, and institutions that focus on graduate education in residential research based universities. They can be useful tools to connect HE institutions with workplaces as more than fifty percent of the MOOC participants are practitioners, which can augment the process of information and knowledge sharing between HEIs and workplaces.

Summary and Conclusions

In this article we have reported findings from the first International MOOC organised at the University of Oslo in 2015. This MOOC consisted of video lectures on contemporary topics (best practices) in international development, online reading material, e-assessment (quizzes), discussion forums, and video conferencing. These components have long been used in distance education, and the course was presented in a similar manner to on-campus courses. What was unique to this MOOC compared to distance education and on-campus courses was the large numbers of students who initially enrolled. This MOOC was similar to an xMOOC in the sense that teachers had a privileged role in designing and determining the course content and the teaching and learning processes. In contrast, the FutureLearn platform is said to be a learner-centred MOOC, but our findings indicate it was teacher-centred in this case, as it was the teachers who designed everything that hap-

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pened on the course. It is therefore mainly an xMOOC, but the asynchronous textual exchanges were the main form of online communication in the course and they supported the participation metaphor (PM) of learning, but were not sufficient to help learners become actively engaged in their own learning. A large portion of the learners liked the course contents and teaching process, and on the basis of their learning activities, we found three categories of learners: joiners, surveyors, and social learners. However, some found some of the course materials to be biased and subjective, which was one of the reasons for the high dropout rates. Among the social learners we observed a phenomenon that can be explained as an emergent form of PM, approaching the collaborative knowledge creation metaphor. The teachers did not engage in interactions with learners, only the mentors appointed by the course providers did. In lack of teacher support, the learners depended upon peer support for scaffolding their learning and a group of learners emerged that took on this task, which is one of the most interesting findings from the study. This was realised through self-organised scaffolding activities: making videos of their experiences, writing blogs and engaging in the debates in the discussion forums. A direction for further research is to explore whether or not MOOCs can promote learning activities that leverage contemporary research in learning analytics, adaptive learning, formative assessment, and collaboration support to achieve better integration of individual and collaborative learning within an environment that is engaging and manageable for both learners and teachers.

Acknowledgements

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