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HOW A MOOC-LIKE COURSE IS FACILITATING TEACHERS' CONTINUING EDUCATION AND TEACHERS' PROFESSIONAL LEARNING COMMUNITY?

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Background

Within higher education, the supply of Massive Open Online Courses (MOOCs) has rapidly increased, both in numbers and in variation of different types. While the literature on different kinds of MOOCs is growing in general, manifested by a couple of systematic reviews (Hayes, 2015; Liyanagunawardena et al., 2013), research on the impact of MOOCs for teachers' continuing education is scarce.

Teachers' continuing education and professional development is high on the political agenda in the Nordic countries. While Finland, Iceland and Denmark already have implemented large education reforms during the last five years, which all have addressed teacher training and professional development. The current governments in the remaining countries Norway and Sweden have made teacher training and professional development, continuing education included, an important issue (Wollscheid, 2015).

In their strategy Competencies for quality, the Norwegian government has defined the goal to provide continuing education and professional development to 10,000 math teachers within 2020 (Ministry of Education and Research, 2012). More generally, in the school year 2015/2016, more than 5,000 teachers in Norway have been offered a program of continuing education. The government strategy of teachers' continuing education emphasizes school-based programs enabling teachers from the same school to cooperate while taking courses (ibid.), and thus, make advantage of *learning communities* (Rismark & Solvberg, 2011) and *collaborative learning* (Vangrieken, Dochy, Raes & Kyndt, 2015).

To address the need for teachers' continuing education and further professionalization and at the same time provide a flexible course supply for teachers, national education authorities launched a MOOC-like course in September 2015, a course limited to two semesters and addressing 5th to 7th grade-school math teachers. The project is led by the Norwegian Centre for ICT in Education, in cooperation with two higher education institutions, and is subject to an ongoing evaluation.

The aim of this paper is to present preliminary findings of this evaluation with particular focus on teachers' perspective as users and learners. Drawing on the assumption that teachers are part of a *learning community*, at their school they are working, and part of an online community, the MOOC-like course participants, and drawing on (preliminary findings) of interview data, the aim of this paper is to describe different types of interactions and types of learning communities, either directly or indirectly related to MOOC-participation.

In the proceeding section, we will briefly review the international literature on teachers as learners in learning communities on the one side and teachers as participants in MOOC-like courses with the means of continuing education on the other side. We will then briefly describe the overall study design, and the methods/data used in this paper. At the end of this section, we will present some working hypothesis, which have lead our data analyses building on interview data with teachers. Finally, we will present some preliminary findings, which we discuss in light of the literature, and provide some implications for further study.

Teachers as learners in learning communities and participants in MOOC-like courses

State-of-the art

In general, Massive Open Online Courses (MOOCs) differ with respect to traditional higher education courses; they are supposed to be open accessible, online and massive (scalability). The first MOOCs were launched in 2008, and fourth years later, the New York Times promoted 2012 as *The Year of the MOOC* followed by the launch of edX by Harvard and Massachusetts Institute of Technology, and other providers such as Coursera. Since then there has been a continuous development in terms of course models, student target groups and variations in terms of openness, scalability and model of knowledge transfer. Speaking of MOOC-like courses in this paper, we focus on a particular type, which has been used for continuous educational purposes, combining advantages of face-to-face online learning situations and advantages of online-learning: small open online courses (smOOC) or small private online courses (SPOOC), which are limited to a certain number of participants, and with the requirement of a participation fee.

Teachers have been a main target group of e-learning courses, since the launch of the first antecedents of MOOCs in the 1960th. Seaton et al. (2015), gives an example of how the Continental Classroom, which applied new technologies, addressed national challenges in terms of education reforms. Several research articles have looked at the potential of MOOCs for teacher education (Jobe, Östlund & Svensson, 2014; Levy & Schrire, 2015; Vivian, Falkner & Falkner, 2014; Zhou, Guo & Zhou, 2015). A literature review by (Saadatdoost, Sim, Jafarkarimi & Mei Hee, 2015; Seaton, Coleman, Daries & Chuang, 2015) has shown that university teachers make up a large group among participants in MOOCs in general, compared to other professional groups. According to a survey of 11 MIT-x-MOOC courses in 2014 with in total 250,000 participants, one of four participants was identified as university teacher. At the same time the survey showed that teachers, more than other professionals,

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were actively engaged in discussion groups. (Seaton et al., 2015) provides a couple of recommendations how to improve courses such as to provide possibilities for interaction, strengthen teachers' network, and use teachers' professional experience. However, limited research exists in terms of continuous teacher education, and teachers participating in smOOC or SPOOCs, with few exceptions. (Zhou et al., 2015). Further, reviewing the literature on study groups Chen and Chen (2015) point out that there is a need for further studies of study groups in the field of online and distance learning.

To our knowledge, only few studies (e.g., Vivian et al., 2014; Zhou et al., 2015), have investigated the importance of MOOC-like courses for school teachers' continuous education. One exception is a pilot study by Vivian et al. (2014) conducted in Australia, investigating a MOOC-like course addressing primary school teachers in teaching computer science, and addressing their needs by opening up for flexibility, spontaneous interactions, support and sharing of online resources. Zhou et al. (2015) stresses the advantages of MOOC-platforms to advance school teachers' collaborate training, social interaction and feedback, in contrast to traditional teacher professional development with shortcomings such as short duration, a lack of theory-practice link and inefficiency.

Research aim

Drawing on these studies on teachers as participants in a *professional learning community* (Westheimer, 2008) (both, online and offline) and participants in MOOC-like courses as a means of further training, our purpose was to explore different types of group interactions and types of professional learning communities related to a MOOC-like course addressing mathematics teachers on primary school levels in Norway.

In this study, we distinguish between two types of professional learning communities of teachers. First, a type of teacher professional community, which stresses learning together with and from colleagues at the same school, and second, a type of teacher professional community across different school sites, the MOOC study group. By the term group we mean "a collection of individuals who share a common social categorization and identity [being a teacher], but the focus remains on individual goals and accountability" (Vangrieken et al., 2015; p.25). More specifically, Zevenbergen (2004; p.6) defined a study group "as a small group of learners (3-6) who formed informal groups that would meet to work on [..] problems related to course material".

At the same time, we can assume that groups of teachers might differ in degree of collaboration with respect to continuous education (ibid.), which might be partly linked to structural factors such as belonging to the same school or not.

Thus, our specific aim was to describe and explore group interactions between teachers from the same school (analogue), teachers from the same teacher network but form different schools, and interactions between teachers in a MOOC-like study group, and how these

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interactions affect their perception of that particular continuous education program, and further, knowledge transfer at school organizational level.

The study: A formative evaluation of a MOOC-like course addressing math teachers in Norway

The original study is an ongoing formative evaluation study of a MOOC-like course addressing 5th to 6th grade-mathematics teachers in Norway (September 2015 – September 2016) commissioned by the Norwegian Center for ICT in Education. To investigate a broad range of topics on two different levels, user level (teachers, school leaders, pupils), governance level (funding; higher education institutions cooperation with project leader), we triangulate both quantitative and qualitative methods and data. Data collection included semi-structured interviews with teachers, school leaders, pupils and higher education institutions providing MOOC-like courses, observational data of participating teachers in online study groups, document analyses (strategic documents) and a teacher survey. The data has been treated confidentially, and none of the informants can be identified in this publication. The study was approved by the Norwegian Social Science Data Service (NSD).

Focusing on teachers and teachers' professional learning communities, this paper draws on interview data of a subsample of teachers, principals and pupils (each lasting between 30 until 45 minutes) at two primary schools in the Eastern part of Norway, one in a municipality in Oslo (school A), another in a more rural community (school B). Both schools were located in a typical *middle class area*, similar in terms of number of pupils (approximately 300), staff number and composition of pupils. During the interviews, the researcher took extensive notes, further validated by audio-recording.

Data analysis

This paper presents preliminary findings from semi-structured interviews with teachers, school leaders and pupils at two case-schools focusing on the user perspective of cooperative learning, and discusses these findings in light of findings in the international literature on teachers' continuing education and teachers as participants in MOOC-like courses. Interview notes were read several times, and openly coded, according to the overarching topics, interaction and professional learning communities.

Results

Description of two case schools

In terms of number of participants in the MOOC-like course in mathematics, the two schools were different. In school A, only one teacher did participate in that particular course, while at school B, four teachers participated, two 4th grade teachers and two 6th grade teachers. At school B we conducted a focus group interview with the four participants.

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Types of group interactions

Table 1 provides themes and subthemes generated by in the process of reading and coding interview notes.

Table 1: Types of group interactions

Theme	Subtheme	School A	School B
MOOC-student group	Relations	Teacher knows one of the participants from earlier, and has met two participants in other contexts.	Four participants from the same school; two 4th grade teachers, two 6th grade teachers
	Interaction (student-to-student)	Separation of the groups in two parts. Some members appear to do quite well, as they talked and came up with reflections, while others are relatively unprepared, according to our informant. Two participants identified by our informant who are mainly coming up with reflections, while the majority contributes with some minor comments.	
	Interaction (supervisor to student)	Low interaction with supervisor	Low interaction with supervisor
School-based professional learning group (analogue)	Relations	Communication with one colleague at the same school participating in another continuous education program.	informal meetings with colleagues study lessons with colleagues (study group)
	Interactions (colleague to colleague)		
Across-school based professional learning group (analogue)	Relations	with three earlier colleagues, who now work at different schools	with two colleagues from the neighbour school (the same school district) on municipality basis
	Interactions		School district meetings
	School-based knowledge transfer	Informal knowledge sharing among colleagues	Informal knowledge sharing among colleagues

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Discussion

Addressing the discussion of an increasing need to facilitating teachers' continuous education by using flexible models, such as MOOC-like courses, in many countries, the aim of this paper was to present some preliminary findings of a small case study in Norway, a formative evaluation of a MOOC-like course targeting mathematics teachers (5^{th} to 7^{th} grade), with particular emphasis on the potential for group interactions within and across MOOC-like groups, and school-based professional communities, in addition to school-based knowledge transfer initiated by course participants.

Drawing on interview data from two case schools, our findings reveal that MOOC-like groups (digital) to a little degree facilitate interactions and strengthen school-based and across school professional teacher communities, if all participants come from different schools. On the other hand, if teachers from the same school or/and the same existing professional network, participate in the course, this MOOC-like course appear to facilitate school-based professional communities and knowledge transfer. In terms of teacher-student interaction within a MOOC-group, it appears that teachers or facilitators do not intake a clearly defined role. Our informants expressed that they did not understand their teachers' role.

Focusing on different types of group interactions between teachers, this paper draws on preliminary findings from interview data with teachers at two schools in Norway participating in a MOOC-like course targeting mathematics teachers in grade 5-7. Further data analyses will triangulate interview data with observational data of participating teachers in interaction with online-group members and their supervisor (in one group) and a survey data of a larger sample of teachers with the aim to describe different types of group interactions (online, offline) between teachers across and within the same school.

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