Dropping out or dropping in? A connectivist approach to participants' learning strategies in an e-learning MOOC pilot.

By

Dan Yngve Jacobsen

Author information:

Dan Yngve Jacobsen
Associate professor

Norwegian University of Science and Technology, NTNU
Campus Moholt
Jonsvannsveien 82

7491 TRONDHEIM

Mobile phone: +47 4140 xxxx
e-mail: dan.jacobsen@ntnu.no
https://www.ntnu.no/ansatte/dan.jacobsen

Abstract

Targeting faculties and external mentors in the teacher-training unit, The Norwegian University of Science and Technology (NTNU) in Trondheim, Norway opened up a MOOC (Massive Open Online Course) pilot on digital learning in the fall of 2014. A main objective was to encourage these to use digital media more actively and hence, also to become role models for their own students' future digital practice.

However, research has shown that a main concern with MOOC programs is attrition. In line with those findings, and according to the course platform data, none of the MOOC participants completed the course material. As the course progressed, less and less pages were opened and obligatory assignments were only rarely submitted. The participants may thus be described as dropouts.

Five of these participants were then interviewed about their MOOC experiences and activities. The interviews were transcribed and analyzed according to Grounded theory procedures. A general finding was that the informants would in fact put some of the material and ideas from the MOOC to use. Even if they dropped out, this indicates a gain from the course. In fact, some of the material that was introduced significantly changed these informants' digital practices when they tested out new ideas in their own teaching. Frame-factors, such as lack of financial compensation or a nonstop flow of competing tasks, however, led the informants to down-prioritize the formal demands in the MOOC pilot.

The informants selectively picked the material that suited their own purpose and therefore qualified as "drop-ins" rather than "drop-outs". Rather than quitters who could not keep up with the pace in the MOOC we met media literate participants who remixed and redefined the MOOC content into a Web 2.0 resource and a stepping stone for self-directed online learning.

Keywords

MOOC. Digital learning. Connectivism. Attrition. Dropout. Drop-in. Grounded theory. Higher education. Teacher training.

1 Introduction

The variety of online tools, online spaces, social media and online activities is growing rapidly, with online learning and learning opportunities as an essential part of this universe. A number of institutions of higher education have over the last decade or so seized this opportunity to reach new masses of students both locally and at a distance, and MOOCs (Massive Open Online Courses) offer easier access to learning for the masses. The offerings are mainly free and for the institutions this development also means a growing population of students.

Rapid growth and easy access, however, also has a flip side. Of all the students who sign in for MOOCs, only smaller numbers complete the courses as they were designed. The pertaining literature report drop-out rates between 90 and 95 % (cf. Yang et al. 2013, Gütl et al. 2014) raising deep concern for the problem of attrition. Attrition can be defined as a decline in the number of students from the beginning to the end of a course or an online program (Gütl et al. op. cit.). It may seem as if students' and institutions' investment of time and effort in many cases are futile and giving little revenue.

On the upside, MOOCs indeed represent a democratic alternative to on-campus learning. The asynchronous nature of these courses let the participants partake in their own time and at their own pace and offering it on-line also means independency of a physical or geographical campus as well as distance. Not only do students from other institutions use this opportunity to supplement classes and other offerings in undergraduate studies or find alternative perspectives on subject matter (Rivard 2013). MOOCs can also be an inexpensive source of continuing education for many people and they have a unique capability in putting together courses to tailor corporate training for particular branches in the professional domain (Overton & Dixon 2014).

In this article I will examine the motives and study strategies of a smaller group of drop-out students in a continuing education program for teacher educators. These students were offered an early version of a MOOC pilot later to be included as a part of continuing education on digital learning for teachers and teacher educators on the open market. The aim is to shed some light on MOOC students who drop out and to see if their efforts were indeed in vain.

2 Background

"Smart learning" was the label chosen for one of four projects at the Norwegian University of Science and technology (NTNU) that were funded by the university's Rector in the spring semester of 2014. The main motivation behind these grants was to improve learning quality in the institution. The Smart learning initiative targeted teachers' and students' digital skills. Online cooperation and networking among teacher educators and their students were seen as driving forces in an institutional strategy to improve digital competence.

The long-term plan was to develop online courses targeting large groups of external participants (MOOCs), but in the short term the project group also wanted to create openings for currently active teacher training staff who wanted to improve their digital competence. For these employees, the program was meant to work as a form of continuing education or staff development program. A main intention behind the offer was to encourage them to use digital media when meeting their own students, thus serving as role models for future teachers. At the institutional level, the project was organized in collaboration between the Unit for learning, technology and society at the Department of sociology and the teacher education unit at the Program for teacher training.

It has been recognized several times that teacher-training institutions in Norway are lagging behind regarding the use of ICT. A report from 2013 stated that teacher educators in Norway by no means live up to the expectation to educate digitally competent teachers and that the programs mainly make use of traditional teaching methods. When technology was used this was mostly limited to learning management systems (LMS) to administer learning, presentation tools to scaffold lectures, interactive tasks with instant feedback and digital portfolios to store and retrieve student work (Tømte & Olsen 2013).

A survey (Langseth, 2012) taken by teacher training staff from the local teacher training unit at NTNU showed similar results. Observing 145 teacher trainees in placement in K-stages 8-13, the researchers found that 79 (54,5 %) of these future teachers used technology during the visits. Moreover, they mainly used web 1.0 technologies such as Power Point (29), Video clips (22), Internet sites (6) and Smart Board (4). Sixty-five teacher trainees (44,8 %) made no use of digital devices whatsoever. In addition, only twelve of the trainees, less than ten percent, had their own pupils use technology during classes. This was so even though computers were easily available in most classrooms. One may argue that teacher trainees go safe in these high-stake situations and therefore limit their use of technology. Nevertheless, the general assumption made by the author is that this survey gives a fair picture of the digital status in Norwegian schools.

Research suggests that teachers and teacher trainees follow the digital development in general, but that their awareness concerning digital technology as tools for learning is scarcely developed. Even if they 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. Similar inconsistencies between private and professional digital competency has also been pointed out elsewhere (cf. Jeffrey et al. 2011).

A main objective in the Smart learning initiative was to develop a MOOC that would motivate the participants to use new technology, particularly web 2.0 applications, in order to facilitate collaboration and learning at all levels in the educational system. At the university level the target group was teacher training faculties and their students, and at the school level the focus was on the tutors who received teacher trainees in placement. Without some support from their advisors and mentors, who are significant role models, there is little expectation of implementing new practices and digital learning networks in the educational sector. A classic study by Lortie (1975) 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 teacher training.

In the fall semester 2014, the Smart learning project had two parallel programs. One was in fact an open access MOOC for the general public, the other was a MOOC pilot designed mainly for staff members in the teacher training unit. The aim of the latter was to enhance digital competence among teachers in the local teacher-training program. Both advisors in schools where the trainee teachers do their practical training and staff from the teacher-training unit itself

were invited. 40 students subscribed initially. With this low number of participants, the pilot may indeed be described as an online course, rather than a MOOC. The plan was, however, also to offer this as a nationwide course under the national program for further education for schoolteachers the following year. Due to the on-line design and further plans, the term MOOC pilot seems to be appropriate after all.

The pilot consisted of five modules and each module discussed one e-learning issue, both in theory and practice. Digital tools were used in each module to exemplify and to create discussions related to how they could change educational practices. The digital tools themselves will obviously change over time given new products and vendors, as the main purpose of the MOOC-pilot was to disseminate notions and ideas about how to implement these tools in contemporary learning environments. The modules that were offered were; personal learning networks (the social web), attention (self-regulated learning and multitasking), assessment for learning (feedback practices), digital (student) response systems (to scaffold flipped classroom and student involvement) and digital blackboards (a short introduction). Each module had its own responsible faculty and course developer, and the need for expertise pertaining to the various subject areas was the main reason to organize the initiative in modules and portioning it out throughout the semester.

3 The Connectivist Learning Approach

Positioning the initiative at NTNU as a MOOC the notion of connectivism becomes noteworthy. Even if connectivist theory has weaknesses that will be discussed below, it presents a viable approach to understanding on-line learning networks and how learners connect to online resources.

The term connectivism was first coined by George Siemens (2004). He envisions connectivism as a learning theory for the digital age. According to him, this approach is different from traditional learning theories, e.g. cognitivism and constructivism, which he sees as obsolete in the online environment. Learning is rather described as a set of connections formed by actions and experience. These connections form naturally through a process of associations and are not intentionally constructed.

Siemens (2005) also introduces the notion of nodes as a key concept. A node is a piece of information or in fact, any element that humans can connect to, scrutinize or experience. Nodes include thoughts, feelings, new information as well as interaction with others. These elements combined create a network and a node grows in importance with the number of connections it has within that network. Significant nodes are likely to be more and more frequently used as those of less value are likely to weaken in importance and vanish over time.

Downes (2007) elaborates on the concept of connectivism, particularly underlining how knowledge and nodes often are distributed across a network of

connections. Such networks can be formed in workplaces or professional organizations, but are more typically developed online. People with common interests, people who want to explore and solve shared tasks or people who simply meet up to share new information or material connect in these networks. Connecting to other people's networks makes our personal networks grow. Connecting to and coding new nodes into our existing personal networks is how learning happens according to connectivism. Connectivism is, thus, a non-cognitivist approach to learning where learning is not based on language and logic. Information may be coded in language, Downes (op. cit.) says, but as he sees it, the properties of linguistic structures are not the properties of knowledge. A phrase like 'construction of meaning', for instance, does not make much sense according to Downes.

Siemens (2005) sees online knowledge as existing in a 'chaos' where the learner should organize this knowledge, connect to it and bring order and meaning to the chaos and thereby develop the connections into personal learning resources. Learning is not necessarily a linear process guided by a curricular plan. In many cases, the learner picks up bits and pieces of information where s/he can find it in order to understand and solve an actual problem or a specific task.

A particularly valuable contribution from the theory lies in its description of knowledge and information as distributed in personal networks on-line and as accessible on demand. In a study of vocational students in their second year (K-11), Haugsbakken & Langseth (2014) showed how these adolescents used YouTube as a source of informal content and connected this to the formal content at school. This was a self-organized process where the students would use the resources at hand online for their current learning purposes.

According to Haugsbakken & Langseth (op. cit.), this approach to learning also means a redefinition of the teacher's role. If knowledge exists in personal online networks, the teacher is no longer the main provider of information. Nor is s/he the principal organizer of knowledge. More, than at any point in history, will the teacher become a mentor who helps the students find learning resources, scrutinize what they know and assist them in setting new learning goals. The authors (op. cit.) also point out how the teacher in an on-line environment should engage in scaffolding learning rather than directing it. Enhanced digital competence among teachers probably also means a renewed understanding of their role in a digital learning environment and a change of instructional approach in the direction of a mentor role.

Despite its contributions, connectivism has also been a target for critique. As pointed out by Bates (2012) for instance, the theory has similarities to both behaviorism and social learning theory. Exposure to experiences and information distributed in on-line networks is seen as crucial in learning. Similar to behaviorist theory, however, the nature of interaction or internal learning processes is not explained or scrutinized, nor is the development of concepts (Clará & Barberát 2014). Hence, we recognize the 'black-box-thinking' from early behaviorist theory. As pointed out, twentieth century behaviorists described conditions for

learning and learning outcomes rather than the learning processes themselves as these were seen as mainly inaccessible to study (cf. Olson & Hergenhan 2016).

Like behaviorism, connectivism may therefore be described as oversimplifying its explanations of the learning process and of what it means to learn something. The theory does also not account for critical thinking or higher order learning. Nor do notions of deep and surface learning, as discussed by for instance Garrison & Cleveland-Innes (2005) or Tallent-Runnels et al. (2006) have a role.

The idea that learning occurs through connections and experiences may, thus, take too lightly on the learning process itself. It misses a clear distinction between information as such and knowledge as a more personalized and sophisticated version of common intellectual properties. It also minimizes the role of typical neo-Vygotskyan terms (e.g. Cole 1985, Wertsch 1985, Werch & Minic 1990, Brunner 1990) such as culture, cultural cognition and the construction of meaning.

Ashworth (2004) points out to us how the learner is an inquirer interpreting and making sense of the learning material from his/her own horizon of previous knowledge. These horizons are, however, not fully idiosyncratic as they are drawn from a common stock of knowledge. Sharing a culture means sharing the canonical truths that are "the result of prolonged and intricate processes of construction and negotiation, deeply embedded in culture" (Bruner 1990:24).

In this sense, however, connectivism also has palpable similarities with social constructivism; what we can know is not individual, but rather based in a larger context where we all take part.

As mentioned, connectivism denies that learning is propositional (Downes 2007), i.e. based on language. The main focus is how existing knowledge is encoded as nodes within personal learning networks that let us access the information on demand. In this notion lies also the strength of the theory; it provides a description of the online environments where learning takes place and of how learning resources and professional development could be organized as personal learning networks in workplaces and in on-line communities where e-learning is introduced.

4 Aim and research questions

Introducing a MOOC pilot on digital learning at NTNU also meant intro-ducing staff members to a network where they would have access to a number of digital resources. The vision was to let the participants connect with peers, in person and online, and with quality resources that would enable them to enhance their digital competence.

Course statistics, however, report an unhappy story. In fact none of the 40 faculties and external mentors who enlisted during the summer of 2014 completed the on-line MOOC pilot during the next fall. Thus, the attrition rate was 100

percent. So, was all the effort and time invested in vain or was there some benefit from initiating the program? The aim of this study is to ascertain what happened to some of the participants who dropped out of the online program without completing the course syllabus and to explore their actual strategies. This could also shed some light on drop-out strategies in general.

The first focus will be to learn what participants signing up actually did during the program. Seemingly, their main motive for signing up was to improve their own skills related to digital learning and to gain knowledge of how to facilitate learning in a digital environment. Nevertheless, they do not necessarily follow a linear pathway through the material or prioritize the same activities. Thus, I want to look into what some of them actually did during the program and the outcome of these priorities. A question that follows is whether these teachers for instance changed their teaching approaches and interaction with their own students inspired by the material offered in the MOOC pilot?

Priorities in a program like this can also be described as strategies to handle personal role expectations and expectations stemming from external demands or perceived frame-factors. We already know that the participants dropped out of the program and attrition patterns will be described below. However, an issue to explore further is what happens when participants drop out. Is this built on complete failure or can some gain be reaped from it. Perhaps was drop-out also a foreseen event by the participants when they signed up? If so, why did they then sign up in the first place? These motives and outcomes may be described as more or less deliberate strategies.

The research questions can be summarized as follows:

1) *How did the teacher educators participating in the digital learning MOOC pilot relate to the various online course content and to the initiative, offered at NTNU, as a whole after signing up?*

2) *What strategies can be found behind the overall drop-out pattern that was observed in the material?*

5 Method

There are two main methodological approaches to the research questions. Firstly, there are the course platform data giving a numerical overview of page-views, participations, submissions and attrition. These data are presented as descriptive statistics in part 5.1. consisting mainly of diagrams and pertaining analysis. Secondly, but foremost, five of the participants were also interviewed telling their story about their MOOC participation. The basic idea behind these interviews was to gather open-ended data inspired by an inductive approach and Grounded theory (e.g. Charmaz 2006, Thornberg & Charmaz 2012). A main idea in this line of methodology is to build on the content of the informants' responses to elicit new theories and insights.

The numerical data were harvested from the Canvas course platform on which the MOOC pilot was constructed. Canvas is basically a digital MOOC platform launched by the American educational software company Instructure to be compatible with their open source learning management system (LMS).

Among the features in the platform is also a course analytics module that allows teachers and developers trace student activity. However, not primarily designed for research purposes the statistical capacities of this module are undersized and using the platform data to analyze participation and MOOC success can be a puzzle. Due to a relatively small group of enlistees (N = 40) this could be done after all based on manual counting and re-entering of the data that was there. The numbers were further developed using an Excel spreadsheet and visualized in three different diagrams. These diagrams describe participant behavior along such parameters as regularity of page views, participations, relative activity and number of assignments submitted. Attrition data were derived from the latter and let us see the overall completion rate of the MOOC pilot.

The platform data mainly showed a significant drop in page views, course modules that were scarcely visited and also a significant number of enlistees who never opened a single module online or submitted a single assignment. In the end the final drop-out rate was 100%. High drop-out rates are of course disturbing, but as mentioned above, not entirely new. Many course developers report low completion rates with less than ten percent of the enlistees finishing the MOOCs.

The limited number of participants, nevertheless, makes statistical inference beyond this particular MOOC hard to do. Hence the data are descriptions of attrition patterns in this particular case-study. The main purpose of the diagrams is to describe and visualize how enlisted participants acted in relation to this particular initiative as a background for further research.

To supplement the platform data, I chose to interview some of the participants. Six informants, three from the participating schools and three from the university's vocational teacher program were selected using an information-oriented strategy; I wanted to find participants who had actually been active in the program and gained some experience. These were anticipated to be able to fill in the picture. The selected informants agreed to talk to me and to have the data recorded and used for analysis. Eventually, I spoke to five participants because the last selectee, a young high school teacher, had moved out of the country. The interviews took place in January 2015, five months after the opening of the first module and about six weeks after the opening of the last module.

The interviews were conducted using a semi-structured procedure with some predefined subject areas. Among the topics I discussed were useful lessons in the program, how new tools and skills had been implemented in their own workplace and how the use of new media was received by their own students. I also discussed local obstacles to digital learning and strategies to get around these. The interviews were subsequently transcribed and coded manually.

The main methodological approach in this study is explorative. Asking open-ended questions to the participants about their strategies and choices means exploring their perspective. In this part of the study there are few predefined

categories and induction is the main analytical pathway. This brings the methodological approach in the direction of Grounded theory where induction is one of the main ideas. "A Grounded theory is one that is inductively derived from the study of the phenomena it represents" (Corbin & Strauss 2008:23). In fact, induction is a main feature in all variations of Grounded theory and was also the main idea behind the original works by Glasser & Strauss (1967). Given the flexibility of contemporary constructivist developments in Grounded theory thinking (Thornberg & Charmaz op. cit., Charmaz 2014) the methodological steps that were almost sacred in the early days of Grounded theory are also open to choice. These are seen as flexible guidelines (op. cit) in the analytical process rather than as prescriptive elements defining the approach.

Since the material was relatively small the coding was done by going through the transcripts on paper. In this process I tried to identify and name segments that would tell me how the informants had treated the on-line material and about their outlook on the MOOC pilot. According to Charmaz, such segments should be named "with a label that simultaneously categorizes, summarizes and accounts for each piece of data" (2006: 43).

During the initial coding I tried to identify these elements in the material. Examples of such elements are "conflict with other tasks", "using spare time" and "being behind". One obvious code combining these elements would be *lack of time.* In the analysis such codes become *core categories* which account for most of the variation (Glaser 1978) and also include the basic elements. By comparing core categories with similar categories from other interviews it was possible to relate this to conceptual elements such as 'too little time allocated for the initiative' and 'conflict with other obligations' which are both frame-factors (cf. Jacobsen 1997) experienced by the participants as putting a strain on the initiative.

In Grounded theory, the constant comparative method is also a basic feature (cf. Glaser & Strauss 1967) and the comparison between previous and new data is a characteristic that drives the analyzes forward. In this material, however, most comparisons were done between the different informants and their accounts. Initially I wrote a conference paper where one of the informants was described in detail. To further develop the analyzes, I later included the other interviews and wrote up their stories. Common traits were identified along the way and developed into categories which sometimes could be synthesized into new categories.

Reiterative processes where new interviews were based on data already analyzed, however, was difficult. Four of the interviews were conducted within one week in the end of January 2015 as one interview, for practical reasons, was conducted two weeks later. The time-window, where the participants could be interviewed was rather limited and it seemed hard to motivate the informants to come in a second time. Unfortunately, this made it difficult to check the categories against new data, as they should ideally have been. Generally, however, I feel I reached a level of saturation and a coherent story based on the data that were collected.

Obviously, names used in the description of the date are pseudonyms and I have also tried to include as little contextual information as possible to protect the identity of the informants. The data and the analyses have been rewritten to make up meaningful narratives and sometimes the informants are allowed to speak to enliven up the material or illustrate certain points.

6 Results

6.1 Course platform data

The course platform data give us an opportunity to quantify participation in the MOOC pilot and also to study how various parts of the MOOC material was used. One way of measuring participation is through counting the pages that the participants opened during a certain time period. Even if this material still today is available to those who enlisted, I have limited the registration of these viewings to the course period which was from the beginning of August 2014 through December 2014. A total of 18 weeks of participation was analyzed using this information.

As previously described, the MOOC pilot comprised five main modules in addition to "Module 0" that consisted of some preparatory material. The initiative also offered two seminars, one at the beginning and one towards the end of the 18 weeks. Since the participants were a relatively limited group these seminars could be arranged on campus for motivational purposes and the first seminar was mostly a presentation of the whole enterprise. Throughout the fall season of 2014 the six modules (Module 0 – 5) were released on-line with tree week intervals.

➔ *Place Figure one here (Number of page viewings per week)*

In the first diagram (figure 1) we see how the three first modules had a relatively high frequency of page viewings at the time when they were first released. In the tree week period until the next module release, the number of viewings declined. The overall highest number of viewings was in week four, which was the opening week of Module one, right after the first seminar and the official launch of the MOOC. During this week, a total of 2911 pages were opened. Starting Module three in week ten the number of viewings had declined to less than 10 % of the top week. For the rest of the course period the number of viewings stays at this moderate level. The data mainly suggest that a majority of the participants lose their interest and drop out after the two first main modules.

Another way of measuring MOOC participation is through the participants' relative activity. This category is also partly based on the number of page viewings. In addition, I used a category named "Participations" from the course platform. Participations can be collaborative activities such as conferences, discussions, shared editing of documents or the creation of wiki pages. It can also be individual activities, such as partaking in quizzes or submitting assignments. Submitting assignments is probably the main component in this category, even

though the Canvas platform does not reveal the nature of the activities that actually took place.

As we can see from the diagram in figure 2, participation is a relatively small category and page viewing is by far the main activity throughout the course. As in the previous diagram the largest activity was registered in week four when module one opened. For comparative reasons the activity in week four has been defined as 100% and percentages measured in the other weeks are relative to the activity in this week. To be able to balance between these measures, I also defined a third category labelled "Inactivity". This latter category describes the difference between the top participation in week four and the activity that can be measured in each of the other weeks. As we can see from the diagram, inactivity increases over the course period.

➔ Place figure two here (Participants relative activity – 18 weeks)

Because page viewing was the main activity also in this diagram, the pattern is similar to what we saw in figure one. However, using percentage and not actual numbers and measuring this relative to the peek participation in week four, the decline in participation over the 18 weeks becomes more obvious. First of all, the first two modules and the pre-module show a relative high degree of activity in their first weeks. During the three weeks, which is the period until the next module is released, the activity is reduced and we see the largest reduction from week one to two in each of these modules.

High activity during the first week may indicate curiosity and motivation, as the decline in activity may indicate that the material after a while was reviewed and processed. It may, however, also represent a drop in interest; the novelty of the new subject is no longer there or the remaining coursework is not intriguing enough. Comparing the last three modules (week 10 through 18) with the first ones I also notice an obvious decline in activity from module two to module three. The activity in the latter part of the course is mostly around ten percent of the activity in the opening week. This indicates that the majority of those who were active in the beginning drop out between the second and the third module. Some of the participants have also dropped out earlier as we also notice a general decline from the opening week of module one and onwards.

A third way of measuring participants' activity is to look into the submission of assignments. This category is also part of the participation category in figure two. However, looking solely on submissions may deepen the perspective. Each module was designed with a number of tasks designed to let the participants work with the course material. The assignments were supposed to be practiced and handed in via the course platform and the submissions were registered in the platform data and are thus available to us. Figure three gives an overview of these data as they were extracted from Canvas.

➔ Place figure three here (Percentage of assignment submitted for each module)

The first assignment in the entire course was submitted by 22.5 percent of the enlisted participants. This is in fact nine people and represents the highest number of submissions throughout the MOOC. If we look at the two first modules the number of submissions mainly vary from seven (17.5%) to three (7.5%) and even zero for the last assignment in each of these modules. The third module has an even number of three submissions for each assignment as the final decline comes in the fourth module when three participants submit the first assignment, one submits the second before the submissions entirely stop.

As in the previous diagrams, we can see that the main activity is in the first two modules with a major decline from the second to the third. Furthermore, even if a number of the participants opened and reviewed large parts of the course material, digging into this and doing the assignments never was a major activity. It may look as if the participants never intended to actually complete the MOOC, or as if the allocated time for this activity was not sufficient and that reading content was prioritized.

To sum up the course platform data, it is fair to say that even if the participants were invited from a selected group, a number of those who enlisted never opened more than a few pages. Some of the course material was never visited and the main activity that was registered centered around the first main modules, mostly one and two. There was an overall failure to submit assignments, in fact any activity beyond opening pages and reviewing the material seems to have been of little importance to the participants. Overall, none of the participants completed the MOOC pilot as such and the platform data, thus, suggest a severe attrition problem linked to the initiative.

6.2 Interview data

In the interviews, all the informants reported enthusiasm about starting the MOOC pilot. They saw digital competence as important skills for the modern-day teacher and reported spending a fair amount of time on this when they first started the course. The informants were enthusiastic and comments ranged between "new but unexplored possibilities", "exiting territory" and "issues that are important to learn about". As should be expected when people volunteer to invest their time and energy in a new project they all expressed an initial positive attitude and optimism. Generally, their expectations were also met and they could take many ideas back to their own workplaces. One of the external mentors in the teacher training program, an eighth grade schoolteacher who volunteered for an interview stated that "work is much more fun now" (Rita).

Nevertheless, as we could see from the overview data retrieved from the course platform, none of these informants completed the package they were offered. In fact, they all dropped out and my informants mainly took two or three modules out of six. They also failed to complete the embedded tasks and assignments. A main objective in this study, however, is to learn more about what lies behind these drop-out patterns. On one side, we find enjoyment and satisfaction, on the other side the same participants were uneager to complete the course material as offered.

In the following section I will present the data from the interviews in some detail. Even if there were five interviews, I have chosen to present the main findings through two informants. These individuals, Anna representing the teacher education faculties and Rita representing the external mentors, exemplify the main traits found in the material. Thus, they will serve as profile informants or cases. Still, in some cases, I also refer to the material as such when I want to root the findings more clearly in a larger context.

A common statement in the interviews was that the informants did not intend to complete the course, take credits or otherwise claim any form of formal competency from it. On the contrary, they told me quite straightforwardly that this was not their goal at any point. Some felt they had the formal education they needed and some felt that taking on an obligation like this simply was too much ado in addition to other daily obligations. One of the in external student mentors who participated stated that when she signed up this was in a good period at work, "but I decided right away that I would not take the exam" (Camilla).

Despite decisions not to take any exams or credits, the informants still felt they were in a time squeeze. Other responsibilities left little time during work hours to dig into the MOOC. The informants, both from the schools and from the university, reported that tasks such as teaching, tutoring students and marking papers took up most of their day. Things may have looked better in the beginning of the semester, but their schedules quickly filled up and other duties started to take priority.

As the course-work progressed, during the semester, the informants had obviously also received mixed signals. There was in fact no time resources allocated for the MOOC-work at either of the workplaces, and even if the employer told them that this was important, the same employers handed out competing tasks. One of the informants also reported that he spent much of his leisure time on this in the beginning, but family obligations and a commission as coach for his son's soccer team made using spare time for the MOOC next to impossible. He had, however, full faith that he would have been able to complete the course, but as pointed out, finding the time became a major difficulty.

> *The largest obstacle to getting through it is time. Simple and easy. I have the skills I need to get through it all if I have the time. Because I dear try, even if it does not turn out right. […] Nothing needs to be perfect all the time (Rolf).*

One of the profile informants, Anna, who we will learn to know better later on, also reported having spent much of her leisure time at home trying to keep up and she even spent some of her Christmas holidays at her office, recording videos. Anna told me that research obligations were yet another task that she felt should take priority, and that time for further-education activities was in short supply.

Camilla, the external mentor and senior high-school teacher sited above for having no intentions to take extra credits, underlined to me how this choice gave her much freedom towards the material. She could do whatever she wanted

with the course syllabus, whether she totally skipped some of it, or took a deep dive into other parts and tested out new digital tools. The obvious upside, she reported, was that she could prioritize based on interest alone or based on the actual usefulness she saw in the different modules. This notion of going after what is useful or interesting, rather than what is required for a diploma, turns out to be a common trait in the informants' learning strategies.

Anna, one of the faculties in the teacher training unit, told me that she had reasonable command of ICT technology, but that she had also experienced a lack of competence when it came to social media such as Facebook. Even if she was a little sceptic towards these media and some of the things that go on there, she felt that these are important both to know about and to master. Hence, she saw both challenges and opportunities in implementing them. She had experienced her flaws and fallacies in connection to particular digital tools, but even so, the challenge in the MOOC pilot had been smaller than she expected. In the program, she had mostly been eager to learn about social media, web 2.0 technology and also some up-to-date learning applications.

After experiencing some of it, Anna felt that some of the course material was both challenging and tempting to test out with her own students. She would even so have liked to do more of this in cooperation with her colleges with whom she usually had a good working relationship. The initial idea was that some of them should work as a group on the course material that was available in the MOOC pilot. At the time of the interview, however, they had not been able to follow up on this ambition and were no longer on the same page. This also meant, she told me, that the ambition to do the MOOC assignments or testing things out together was abandoned and she was now concentrating on following up the parts that she saw as most useful to her.

A main obstacle to her course ambitions, Anna said, was the time she felt she could spend on going deeper into the material. This was also the case for the other informants. Both Anna and the other participants told me that time was not easy to find. Because of the employer's policy not to offer any extra resources for the MOOC initiative, lagging behind, doing less and eventually dropping out became her way out of the time-squeeze. She pointed out that other tasks related to her job were equally important and should be given proper attention. Eventually, she had stopped opening the digital course platform and also stopped looking into new material.

When she was active in the MOOC, Anna had found the course module on online tutoring particularly useful. Earlier, she used to give her students response on written material by way of written comments. When tutoring students via the internet and using digital technology, she used to write her written comments in small "bubbles" embedded in the text documents that her students had submitted. Such bubbles are otherwise known to most of us from professional pdf-programs (e.g. Adobe). Anna described to me that she used to feel comfortable with this way of giving feedback to her students and also described it as "her way". Mainly satisfied with her approach she had seen little or no point in developing her response method any further at the time.

In the module on online tutoring, however, she was introduced to a program called "Screencast O'matic". Taking the program into use enabled her to upload text documents produced by the students to the computer screen and to put herself in a small window along with them. This allowed her to record her student feedback in a new manner. Comments, which previously would have been written bubbles, were now presented orally and recorded along with a small video of herself as she gave the response. Moreover, having the document on screen, she was also able to point to particular sentences or passages in the document as she took the students through their texts for feedback.

Using a free version of the program, the recordings had a maximum length of fifteen minutes. This was, however, enough for her purpose as her recordings mostly were between 10 – 15 minutes. One main difference from previous practice that she pointed out was the nature of her comments. As some issues had been difficult to put in writing in the past the oral format allowed her to elaborate on her feedback in a different way. In the interview she also reported that she was able to offer more questions for the students to think about. A bonus was also that it took less time to record the videos than it would have taken to write it all down.

In the interview she laid out the benefits of this approach. According to her the video approach produced a more multilayered feedback and gave the students more input to reflect on. Because the students could hear her voice, she also assumed that it was easier for them to understand what she liked and did not like about their assignments. Furthermore, because they could see her and read her facial expressions and body language, they received the feedback in yet another channel. She saw the non-verbal content of the videos as carrying supplementary information that gave the feedback more substance. Anna believed, she told me, that because of the non-verbal content of the feed-back, her students were happier and more content. She also substantiated this claim when she described the students' responses; Through their logbooks, which she collected after the event, they reported that the digital response was fantastic, that they listened to it repeatedly and that it motivated them to go on with their learning.

In Anna's experience, written comments are easy to read as critique even if they are in fact meant as stepping-stones too further growth for the students. She saw students in this situation as vulnerable and not too robust when facing critique. According to her they could easily identify themselves as unfit for their study ambitions and as someone who should rather leave the program. Anna described to me how hearing her voice and seeing her mimics during the feedback sessions profoundly changed this and that the students saw her inputs more as she intended them.

Anna was also specific about the fact that she felt she did not give any more positive feedback than she used to do before the change. Nevertheless, her students reported to her that hearing her voice reassured them and made them feel that this was going to turn out OK. "In a way they feel that I have faith in them in a totally different way than before", she said. She also reported that the meeting between the students and herself, as a teacher and as a tutor, had become a much

more personal encounter. According to her, a small effort had brought about a major change.

Despite not finishing the MOOC pilot, Anna has obviously had a good return on the time investment she made in "Smart learning". In particular, this has changed her approach when tutoring distance students online and she reported great benefit from the change.

Another informant, Rita, who is a secondary school teacher and external mentor for the teacher trainees studying for their diploma, had initially started out as a dutiful MOOC student reading the material, submitting the assignments and so on. After a while, however, she started to feel that this was just too much. For her, as for the other informants, time became a constraint and she stopped looking at the assignments for each module. Hence, she described herself as increasingly interested in looking for suggestions and methods that she could use in her own classes (K8 – K10). At the time of the interviews, Rita had dropped her ambitions to take credits from the course. Despite this, she told me "[…] I am very happy that I took the course because I think differently about my teaching now, and have many other angels and methods".

Rita also told me how she changed some of her outlook based on what she learned in the MOOC pilot. In particular, she describes the concept of personal learning networks (PLN) as useful to her. Not only did this make her more conscious about her own on-line networks and how to use these, but she told me that she saw her pupils' digital activity in a different light. She had also become more prone to pick up things from her own online networks and to see tips online as actual resources. She also reported seeing Twitter and Facebook-groups where she has signed up as personal learning networks, and had also become much better at spotting useful elements in the group feed. She also told me that this was where she picked up the idea to organize some of her own classes via Facebook.

Rita reported that she regularly let her students use their smart phones in class. School regulations ban the use of mobile phones other than when sanctioned by a teacher. According to Rita this is not a constraint. She rather uses the openings the rules provide; mobile phones are allowed when she allows them. At the time of the interview, she tells me, she is trying out One-note and her pupils are encouraged to download this to their phones to have easier access to their scanned documents and notes. Pupils regularly loose much of what is copied and handed out. Consequently, she hoped that having this available on the phone will help them find the material when they need it. Single paper copies, she explained, are easy to lose "but they don't lose their phones. Nope!"

Previously she had also let her students use the phones for "Socrative", which is a digital student response system. She also mentioned some other learning apps that she was in the process of learning and adopting. According to Rita the smartphone had become a useful tool in these classes and not an enemy of peace and order as school regulations suggest.

During the interview we also talked about Facebook. Rita claimed that through Facebook, her class had become an online learning network. "It's learning", which is a nationally developed LMS system, never had the same

influence as Facebook, she told me. The students simply did not open it on a daily bases, and messages and material that is put out there is simply not accessed or put to use according to her. Facebook is not ideal as a learning tool, but, according to Rita, the obvious upside is that all the students have the application on their smart-phones and that they can get updates immediately when new items or messages are posted. She underlined, however, the age-limit, which means she cannot use it with her younger students without violating the FB rules. As she saw it, this would send the wrong signal and some parents are also skeptical about letting their young ones use the medium even if they are old enough. To cover up for such restrictions Rita told me that she also gives messages and distributes handouts in class. Yet, for the great majority of her students Facebook functions as a learning community where messages are put out, where homework assignments can be found, where they can find useful links to learning material, where they can ask questions and where assignments can be debated.

Another use of Facebook that she reports is as a channel to answer student questions on her leisure time. In the past, they would have phoned her if they were stuck when doing their homework. Facebook, on the other hand she says, lets her answer the questions in her own time and in some cases, other students are faster than her to help their classmates. She also describes how some of the students will post math-assignments or pictures of their own solutions to ask the others for help before larger tests. According to Rita, the Facebook group in many ways works in the same manner as the discussion groups on ordinary LMS-es was supposed to; but also involving almost all the students, at least the older ones, because they are logged on anyway. Not all the students are equally active but Rita tells me that even if they are less lively contributors, they get something out of following the discussions and are able to retrieve useful information from the Facebook group. In any case, it is very useful to those who really participate, as is any other learning activity.

According to Rita, the Facebook group establishes a personal learning network for the students. In the network, the students are connected to other students with different sets of knowledge and are able to help each other out also on their spare time. Communication is online and it is mostly easy to find what they are looking for.

Rita told me that the MOOC pilot made her aware of both personal learning networks as learning resources and of Facebook and other media to implement these resources in day-to-day school activities. According to her, smartphones have become tools rather than toys in her students' classroom and even on their leisure time. The smartphones and Facebook connect them to learning resources and to each other for help. Mainly, Rita described to me that participating in the MOOC pilot forcefully changed her approach to digital learning and digital learning aids even if she dropped out half way.

7 Discussion

Apparently, the MOOC pilot participants failed to complete the program due to other obligations in a busy day-to-day schedule. As mentioned, most informants reported constraints as to how much time they could invest. Trying to keep up with demands from different directions caused frustration, and if conforming they would in fact have to allocate time from competing obligations such as work, family life or leisure activities.

None of the employers involved let the participants have extra time resources for the project. This was either a double signal, or the employers expected the participants to invest more than they were prepared to offer. The participants on their side felt time was too scarce and seemed unmotivated to submit the embedded assignments and to complete the MOOC syllabus as it was offered. Lack of available time, thus, was a frame factor (cf. Jacobsen 1997) that may have motivated the participants to leave the program. Both numerical course platform data and reports given in the interviews support this observation. Because none of the participants completed the course in full length, they may in fact be described as drop-outs.

As already mentioned, drop-out problems have been a major concern in relation to MOOCs worldwide. In our case, the attrition rate was one hundred percent as none of the enlistees completed the program. There is, however, also data in the material to support a different conclusion. Exploring the matter further, I also find that a majority of my informants never had any intention to complete all the modules. A typical pattern is signing up, choosing one or two MOOC elements from the platform and getting quite a lot out of those, regardless of the formal requirements necessary to earn credits from the program itself. Both Anna and Rita are representatives of this approach which I choose to describe as a "drop-in" strategy.

Participants like Anna and Rita, not planning to take credits or to fully complete the MOOC, define this drop-in strategy. Drop-ins sign up for the MOOC to have access to the course platform and to pick and choose from it according to their own learning agenda. Rivard (2013) describes participants who sign up without taking credits. According to him, one motive could be to have a different outlook on a subject they take in an ordinary program, others see this as a better way to spend time "than watching television". Motives differ, he points out, but none of these have in mind to complete the MOOC they signed up for, and they mainly also do not submit assignments or other material. Hill (2013) defines drop-ins as:

> *"students who become partially or fully active participants for a select topic within the course, but do not attempt to complete the entire course. Some of these students are focused participants who use MOOCs informally to find content that help them meet course goals elsewhere."*

In our interviews, the informants described how they used ideas and insights from the MOOC both to improve and to change their own teaching. As we could see, both Anna and Rita were mostly interested in dropping in on selected topics to find material that could help them improve in their daily job. Rather than completing assignments pertaining to the various MOOC modules, their focus was to construct their own "assignments" based on their daily work situations and to test some of the ideas out on their own students.

The informants, thus, were more concerned with what tangible skills and practices they could get out of the MOOC than the credits and formal diplomas. This is a form of learning on demand related to actual challenges. "Learning on demand" is a concept that is often associated with online learning. The knowledge is available out there and can be retrieved when needed, independently of time and place. According to Offenbartl (2003), learning on demand provides a more flexible approach to learning, thus answering the many competing demands towards participants.

Connectivism terminology describes online resources as "nodes" (Siemens 2005). As previously defined, these elements make up the building blocks of online learning networks. Nodes can be other people, websites or, in fact, any resource available on the Internet. Life on the Internet is a constant learning process where participants acquire new nodes and construct new networks all the way. As we form new connections or develop our connections into larger networks, we are constantly building our knowledge resources. Access to new information means expanding and updating our networks. Nodes that are appropriate and useful in our daily lives are strengthened and those of less importance weaken and fade out, according to Siemens.

In the MOOC pilot, six modules were put out on the Canvas platform. One should perhaps keep in mind that these were made available with a few weeks apart. The participants who had signed up were seemingly following the MOOC with not too much involvement and looking for useful material. Finding such material, they could skip the trail. This would explain why the participants drop in on the first modules, while the last modules were scarcely opened during the whole semester.

Using the above terminology, these first modules can be seen as online nodes, to which the participants connect. The participants considered the material valuable and made use of it. Defined as nodes the material was included in the participants' own learning network. Later modules, however, were not as much considered, perhaps because the participants were content with what they had already learned and because time was up anyway. In a modern context, where the available knowledge is growing and evolving, the skill to plug into learning resources when needed seems to be a viable alternative to accumulating encyclopedic knowledge defined by course providers or others. New knowledge is available all the time and much of this is useful whether it is related to smart learning gadgets, online didactics or other issues.

Obviously, tapping into information online is not the same as learning it. Nodes in Siemens' terms (op. cit.) are nodes of information, not nodes of

knowledge and if we make this distinction there is also a difference between learning something and having access to that information. There is, so to speak, a difference between having access to the notes and playing the piano. The information is obviously helpful, but not necessarily sufficient. In the empirical examples above, we can see how Anna and Rita are tapping into the nodes to find what they need. In combination with what they already know they use this information quite freely to develop new teaching strategies. This is the actual learning process. As previously pointed out connectivism does not account for this learning process but rather for online resources and circumstances that foster learning. These are of course important, but what Anna and Rita do is constructing their learning networks with the information from the MOOC course platform as building blocks, defining and redefining the content to fit their own experiences and obligations.

Online information thus, rather provides the raw material for interactive learners and the web becomes a vessel for that content. The learners are transforming and making use of the information rather than just connecting to it. This change, often branded a change from Web 1.0 to Web 2.0, also means the transition from passive users of information to active online participants, creating, sharing and interacting. The users contribute to the media content (e.g. wikies), they search the web to find content from different sources, they do social networking and they collaborate. Much of the Web 2.0 content is user generated and rather than storing it locally, storage is cloud-based and oftentimes shared. This also creates a more interactive approach to the material. DiNucci (1999) who coined the term Web 2.0 envisioned the web to be "understood not as screenfuls of text and graphics but as a transport mechanism, the ether through which interactivity happens (page 32)."

The approach taken by the informants in this study has obvious traits from Web 2.0 approaches, and even if they enroll in a defined program offered by their employer, they go in and out of it at their own convenience treating it as any other online resource. Privileged access to this content or flexibility in online learning are not factors that will enhance their completion rates as predicted by Offenbartl (2003). Even if the MOOC pilot was designed as an online course with modules, recorded lectures, extra material, assignments, online interaction and deadlines, it was not treated as such. In itself, this change, from the designers' plan towards the participants' strategies, represents a redefenition from a Web 1.0 design towards a Web 2.0 approach to learning. In fact, the drop-in strategy that was adopted by the participants, and also described above, could itself be defined as a Web 2.0 strategy.

The notion of digital literacy (O'Neill & Hagen 2009) becomes useful here. In today's highly mediated societies, there is a flood of information. Media literacy is an essential skill to make sense of all the opportunities that are available online and elsewhere. This involves new modes of reading beyond the conventions of reading linear and print media, and must incorporate the users' engagement with digital media from information searching, entertainment and game playing to communicating and creating new content. A core ability of media

literate citizens is the ability to remix and to create new content from what is offered (cf. Erstad 2008). Being able to represent their own experiences and meet their own needs through redefining and creating content also means a form of empowerment that challenges established notions of the author as creator of content and an authority on the subject.

Bates (2015) makes a distinction between xMOOCs and cMOOCs. xMOOCs are designer controlled comprising usually a specific platform, video lectures, assignments, peer-instruction and assessment, discussion space, support material and some form of final assessment and certificate. cMOOCs build on a different educational philosophy with emphasis on networking and participant contributions. Social media replace a defined digital platform, content is suggested and provided by the participants, communication is distributed in many self-organizing networks and assessment is informal and based on the feedback participants receive from each other. As the xMOOC build on a Web 1.0 approach, the latter is more affiliated with a Web 2.0 approach.

In the present study, the informants contest the role of the MOOC creators as authors or authorities on subject matter. Rather than following the plotted trail to earn credits in the employers' account for supplementary learning they make their own choices regarding the content and what to do with it.

The informants are well educated and media competent participants, who will take control, define their own learning needs and their own boundaries. The online learning material becomes a source, or a node, that they can connect to and harvest for good ideas. In reality, they have redefined an original xMOOC offered by the teacher-training unit into a cMOOC where they are in charge of the content and how to approach it.

8 Conclusion

Two questions were asked in this study. The first concerned how the participants related to the online content and the MOOC pilot itself. From the course platform data, we see how the information is accessed by opening pages in the platform but also how this activity is declining over the weeks. We see how participants fail to submit assignments and eventually drop out of the initiative. By these measures the drop-out rate was 100 percent and the initiative appears to be a failure. Nevertheless, from a closer study of some of the participants we learn how some of them tapped into the information and material in the MOOC platform and made something useful of it even if they dropped out of the initiative as a whole. Two profile cases, Anna and Rita, were portrayed in particular and they both turned out as success stories where the MOOC pilot made a difference when they set out to develop their digital teaching strategies.

The other research question concerned the strategies behind the drop-out pattern. As pointed out, our informants choose a drop-in strategy that let them search for and define the material that was useful to them in their daily work. Mainly, the informants were clear that they did not envision themselves as

completing the course. This was partly because they never meant to, and partly because they could not find the necessary time in between other tasks.

However, rather than as participants not following the trail of the course designers, we can see them as flexible users who define their own learning needs and utilize, prioritize and rearrange the material accordingly. I pointed out that this in fact was a drop-in strategy and that it furthermore could be defined as a Web 2.0 strategy. Such a strategy, of course, represents a challenge for the course designers who have outlined a set of modules with suitable content to take the participants in the direction of more digitally competent teachers and role models for their own teacher trainees. When the participants chose the drop-in strategy, they also remixed the content of the MOOC and in fact challenged the employer's and course designers' ideas behind the initiative. On the other hand, the employer's and course developers' intentions were partially met when some of the participants undeniably bettered their competency on digital learning technology.

However, the users had an eclectic strategy where they would utilize online resources and remix the content to fit their own learning needs. Once they found what they were looking for, they did not pay much attention to the course design and the course content as a whole. As suggested, the participants were competent internet users who put their own learning agenda at the front and reshaped the MOOC pilot into a cMOOC where they themselves were in control of the learning. The platform material was turned into a node that, together with other offerings mainly online, made up the architecture of their "new" MOOC.

Perhaps did the fact that the participants were experienced teachers, with a clear notion of their learning needs contribute to their approach. Perhaps would more stringent demands, more time resources, better time control and more formal assessment have encouraged a different outcome? Perhaps did the participants also choose the more sustainable approach? Obviously, future research on MOOC attrition should pay more attention to what happens when participants drop out and what the outcome of attrition could be at a deeper level. Maybe could the findings in this study also inspire the design and analyses of larger data samples to see if the drop-in patterns identified are typical or just random behavior found in this particular study.

References

Ashworth, Peter (2004) Understanding as the transformation of what is already known, Teaching in Higher Education, 9:2, 147-158, DOI: 10.1080/1356251042000195385

Bates, Tony (2012): What's right and what's wrong about Coursera-style MOOCs? Retrieved from: http://www.tonybates.ca/2012/08/05/whats-right-and-whats-wrong-about-coursera-style-moocs/

Bates, Tony (2015): Teaching in the digital age. Guidelines for designing teaching and learning. Chapter 5.3: Variations in MOOC designs. Retrieved from: http://opentextbc.ca/teachinginadigitalage/

Bruner, Jerome (1990): *Acts of Meaning.* Cambridge, Massachusetts, London, England: Harward University Press.

Charmaz, Kathy (2006): Constructing Grounded Theory: A Practical Guide through Qualitative Analysis. Sage Publications.

Charmaz, Kathy (2014): Constructing Grounded Theory. 2nd edition. Sage publications.

Clara, M. & E. Barberát (2014): Three problems with the connectivist concept of learning. *Journal of Computer Assisted Learning, 30, 197-206*

Cole, M. (1985): The zone of proximal development: where culture and cognition create each other. *In: Wertsch, J. (Ed.): Culture. Communication and Cognition. - Vygotskian Perspectives. Cambridge, London, New York, New Rochelle, Melbourne, Sydney: Cambridge University Press.*

Corbin, Julia & Anselm Straus (2008): Basics of Qualitative research: techniques and procedures for developing Grounded theory. 3rd edition. Sage publications.

DiNucci, Daarcy (1999): Fragmented future. Print 1999, 32, 221. Retrieved from: http://darcyd.com/fragmented_future.pdf

Downes, Stephen (2007): What Connectivism Is. http://www.downes.ca/post/38653

Erstad, Ola (2008): Trajectories of remixing: digital literacies, media production, and schooling, In: Colin Lankshear & Michele Knobel (Eds.), *Digital literacies - concepts, policies and practices.* Peter Lang Publishing Group. ISBN 978-1-4331-0169-4. p. 177 - 202

Garrison, D. Randy & Martha Cleveland-Innes (2005): Facilitating Cognitive Presence in Online Learning: Interaction Is Not Enough. In: The American Journal of Distance Education, 19(3), 133–148. To be retrieved from: http://www.anitacrawley.net/Articles/GarrisonClevelandInnes2005.pdf

Glaser Barney (1978): *Theoretical sensitivity: advances in the methodology of grounded theory.* Sociology Press.

Glaser, Barney & Anselm Strauss (1967): *The Discovery of Grounded Theory: Strategies for Qualitative Research.* New York, Aldine de Greuytner.

Gütl, Christian, Rocael H. Rizzardini, Vanessa Chang & Miguel Morales (2014): Attrition in MOOC: Lessons Learned from Drop-Out Students. In: Lorna Uden, Jane Sinclair, Yu-Hui Tao, Dario Liberona (eds.): Learning Technology for Education in Cloud. MOOC and Big Data. Proceedings from Third International Workshop, LTEC 2014, Santiago, Chile, September 2-5, 2014, 37 – 48.
To be retrieved from: http://link.springer.com/chapter/10.1007%2F978-3-319-10671-7_4

Haugsbakken, Halvdan; Langseth, Inger Dagrun. (2014) YouTubing: Challenging Traditional Literacies and Encouraging Self-Organisation and Connecting in a Connectivist Approach to Learning in the K-12 System. *Digital Culture and Education, 6 (2), 133 – 151*
To be retrieved from: http://www.digitalcultureandeducation.com/volume-6/haugsbakken_langseth/

Hill, Phil (2013): *Emerging Student Patterns in MOOCs: A Graphical View. e-*Literate. *Retrieved from: http://mfeldstein.com/emerging_student_patterns_in_moocs_graphical_view/*

Jacobsen, Dan Y. (1997): *Tutorial Processes in a Problem-based Learning Context; Medical Students' Reception and Negotiations*. Thesis for the degree of Doctor polit. NTNU. To be retrieved from: http://www.svt.ntnu.no/psy/Dan.Jacobsen/Utlegg%20i%20PDF-format/Dissertation%20PBL.pdf

Jeffrey, Lynn, Bronwyn Hegarty, Oriel Kelly, Merrolee Penman, Dawn Coburn, and Jenny McDonald (2011): Developing Digital Information Literacy in Higher Education: Obstacles and Supports. In*: Journal of Information Technology Education* **10**, 383 – 413. To be retrieved from http://www.jite.org/documents/Vol10/JITEv10p383-413Jeffrey1019.pdf

Langseth, Inger (2012): Teknologi i et lærerstyrt undervisningsdesign for fremmedspråk. *Norsk pedagogisk tidsskrift 2012, 2, 86-99*

Lortie, Dan C. (1975): *Schoolteacher – A Sociological Study*. University of Chicago Press.

Offenbartl, Susanne (2003): Distance Learning: Learning on Demand and Just in Time. In: Bernath, Ulrich and Eugene Rubin (Eds.): *Reflections on Teaching and Learning in an Online Master Program. A Case Sudy.* Studien und Berichte der Arbeitsstelle Fernstudienforschung der Carl von Ossietzky Universität Oldenburg Band 6: 267 – 276.

Olson, Mattew & B.R. Hergenhan 2016: *An Introduction to Theories of Learning* (9th ed.) New York, East Sussex: Taylor & Francis Group.

O'Neill Brian & Ingunn Hagen (2009): Media literacy. In: Livingstone Sonia & Leslie Haddon (Eds*.): Kids Online. Opportunities and risks for children. The Policy Press. 229 – 239.*

Overton, Laura & Genny Dixon (2014): Using MOOCs to transform traditional training. The role of MOOCs in corporate training programmes. Towards Maturity. To be downloaded from: http://www.towardsmaturity.org/article/2014/05/12/-focus-lessons-moocs-corporate-learning/

Rivard, Ry (2013): Measuring the MOOC Dropout Rate. *Inside Higher Ed*. Retrieved from: https://www.insidehighered.com/news/2013/03/08/researchers-explore-who-taking-moocs-and-why-so-many-drop-out

Siemens, George (2004): Connectivism: A Learning Theory for the Digital Age. In eLearnSpace. Retrieved from: http://devrijeruimte.org/content/artikelen/Connectivism.pdf

Siemens, George (2005): Connectivism: Learning as network-creation. In eLearningSpace Retrived from: http://www.elearnspace.org/Articles/networks.htm

Tallent-Runnels, Mary K., Julie A. Thomas, William Y. Lan, Sandi Cooper (2006): Teaching Courses Online: A Review of the Research. In: Review of Educational Research Spring 2006 76: 93-135. Downloaded from http://rer.aera.net at NTNU August 12 2016.

Tapscott, Don (1998): Growing up digital - The Rise of the Net Generation. McGraw-Hill

Thornberg, Robert & Kathy Charmaz (2012): Grounded theory. In: *Lapan, Stephen D., Quartaroli, Marylyn, Riemer, Frances Julia (Eds): Qualitative Reasearch: An Introduction to Methods and Design.* JOSSEY-BASS 2012

Tømte, Cathrine Edelhard & Olsen, Dorothy Sutherland; (2013). IKT og læring i høyere utdanning: Kvalitativ undersøkelse om hvordan IKT påvirker læring i høyere utdanning. ISSN: 1892-2597. ISBN: 978-82-7218-939-5. Nordisk institutt for studier av innovasjon, forskning og utdanning.

Wertsch, James.V. (Ed.) (1985): *Culture. Communication and Cognition. Vygotskian Perspectives.* Cambridge University Press.

Wertsch, James.V. & N. Minic (1990): Negotiating Sense in the Zone of Proximal Development. In: C.A. Maher & N.S. Fagley (Eds.): *Promoting cognitive growth over the life span*. Hillsdale, NJ: Erlbaum.

Yang, Diyi, Tanmay Sinha, David Adamson & Carolyn P. Rose (2013): "Turn on, Tune in, Drop out": Anticipating student dropouts in Massive Open Online Courses. Proceedings of the 2013 NIPS Data-driven education workshop 11, 14.
Retrieved from: https://www.cs.cmu.edu/~diyiy/docs/nips13.pdf

Figure 1: Numbers of page viewings per week

Figure 2: Participants' Relative Activity – 18 weeks

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12	Week 13	Week 14	Week 15	Week 16	Week 17	Week 18
Inactivity	795	1610	2168	0	1201	1309	558	1753	2011	2736	2749	2619	2794	2706	2618	2483	2820	2866
Participations	196	89	59	126	38	68	100	33	76	17	26	27	7	11	9	35	10	6
Pageviews	2046	1338	810	2911	1798	1660	2389	1251	950	284	262	391	236	320	410	519	207	165

Figure 3: Percentage of assignments submitted for each module

There is one column for each given assignment, the percentage of students who have submitted the assignment is shown on the top of each column, zero instead of column indicated that none of the