



The Role of Support Units in Digital Transformation: How Institutional Entrepreneurs Build Capacity for Online Learning in Higher Education

Inger Langseth¹ · Dan Yngve Jacobsen² · Halvdan Haugsbakken³

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Abstract

This study used New Institutional Theory to explore how entrepreneurial activities in support units contribute to digital transformation in higher education in Norway. We describe how entrepreneurs initiated and operationalized support for Massive Open Online Courses (MOOCs), micro-credentials and fully online courses in pockets of innovation within existing institutional arrangements. An ambition was to understand why capacity building for digital transformation in a country described by the Organization for Economic Cooperation and Development (OECD) as digitally mature is lagging behind other countries. We obtained our data from qualitative interviews with faculties and staff involved in fully online course production. The informants were chosen through strategic sampling from support units and faculties, where they filled different roles in the production of such online courses. Our findings describe entrepreneurial activities that strongly contributed to the emerging social field of digital transformation. Located in pockets of innovation, the entrepreneurs provided open digital platforms, a pedagogy for online course design and support for faculties who engaged in online course production. Yet, the findings also confirm previous research pointing out how the lack of supportive leadership may impede successful digital transformation in higher education institutions. The study concludes with a model for digital maturity which may be useful to researchers and stakeholders. The model can also support entrepreneurial processes in online environments.

Keywords MOOCs · Micro-credentials · Online course production · Digital transformation · Entrepreneurship · Institutional entrepreneurship · Lifelong learning

A landscape is a series of named locales, a set of relational places linked by paths, movements and narratives. It is a ‘natural’ topography perspectively linked to the existential Being of the body in societal space. It is a cultural code for living, and anonymous ‘text’ to be read and interpreted, a writing pad for inscription, a scape for human praxis, a mode of dwelling and a mode of experiencing.

(Tilley, p. 34 in Wittgenstein *A Phenomenology of Landscape*).

Extended author information available on the last page of the article

1 Introduction

The use of digital technology is undoubtedly a major characteristic of the current transformation in teaching and learning in higher education (HE). In this landscape, we understand *digital technology* as a collection of mediating artefacts; portals, platforms, apps, software programs, artificial intelligence, data etc. used to facilitate ubiquitous teaching and learning and collaboration. Contemporary discussions underline the need to explore and use the potential of digital technology in HE and facilitate the use of these digital tools to achieve better offerings and outcomes for students and faculties (Berghaus & Back, 2017). In the wake of this development, HE institutions in Norway have established various technical and pedagogical *support units* to ease the transition to new digital technologies and strengthen the effect of the investments (Fosslund et al., 2020).

In contrast, researchers (Bygstad et al., 2022) describe Norwegian HE as a dual system with two streams of digitalization going in different directions. On the one hand, educational solutions are standardized and run by the IT-department with technical support for faculties in a top-down approach to teaching and learning on campus, for instance when introducing Learning Management systems (LMS). On the other hand, academics in their field, either individually, in ad-hoc teams or in projects, seek to develop new ways of online teaching and learning in their subjects. Massive Open Online Courses (MOOCs) are for example developed on open platforms to serve different educational ends, often with limited or no organizational support. Such bottom-up results are decentralized and may also be disruptive. According to Bygstad et al. (op. cit.), the dual system has contributed to digitalization, but failed to create disruptive change in the HEIs at organizational levels.

Surely, the massive use of and support for online meetings and recorded lectures during the COVID lockdown in the early 2020s contributed to the understanding of how digital technologies facilitate teaching, learning and collaboration online (Capranoset et al., 2021). Nevertheless, a move towards quality education online goes beyond and deeper into the typology and taxonomy of digitalization. While faculties lean on support staff¹ to enhance project results, such as online courses on open platforms, Norwegian support units seem, so far and to a large extent, to be top-down, experience-based and policy driven (Lyby et al., 2018; Tømte et al., 2020). This seems to apply to all levels in Norwegian education.

From our position in a research project that is driven by a strong belief in open access to online education for all and entails disruption in terms of MOOCs and online course offerings on open platforms with comprehensive support for faculties, our goal in this study is to contribute to a deeper understanding of entrepreneurial bottom-up activities in and in relation to support units. The study highlights the critical role that entrepreneurs, who are located in *support units*, play to support faculties and build capacity for fully online learning, and thereby pave the way for disruptive changes. Moreover, as support units are located in the organizational line and thereby function as a link between management and faculties, they are also positioned to regularly report on bottom-up initiatives with implications for strategy and policy in their organizations. Hence, administrative *support units*, which so

¹ We distinguish between (1) faculties, who are contracted with teaching obligations and allocated research time, and (2) staff (administrative and support staff) who occupy managerial positions or provide general support in the use of digital infrastructure. Both faculties and support staff are represented in the support teams, as they are the informants in this study. We will generally refer to our informants as entrepreneurs.

far have generally been understood as a group of staff that is established to support the top-down implementation of new technologies in the organization, must be redefined.

As we will discuss below, our approach to this research is qualitative. Through this method, we will try to establish a deeper understanding of how stakeholders in Norwegian HEIs can benefit from entrepreneurial activities to build strong *support units* and thus contribute to moving the institution forward. We are foremost interested in entrepreneurs located in larger support units, who challenge established norms and practices and constitute a *pocket of innovation*, which we define as a group of staff and faculties with complementary competences, who are working towards a common goal outside traditional institutional arrangements and aiming for disruptive changes. They are mutually accountable and characterized by the implementation of new ways of thinking, acting and organizing. We further aspire to understand to what extent the knowledge that is produced in these pockets of innovation constitutes valuable contributions to a strategy for *digital transformation*, which generally means an organizational change based on digital technology and managerial decisions, entailing new forms of course and study program deliveries. The study is guided by three research questions:

- 1) How do institutional entrepreneurs at Norwegian universities build capacity for developing fully online courses?
- 2) What characterizes the collaborative processes between support staff, faculties and other colleagues during fully online course production?
- 3) How can digitalization be described in relation to levels of digital maturity in higher education in Norway?

Before we go on with these questions, we will briefly describe the landscape of online course deliveries, as it has developed over the last decades. New Institutional Theory and current research on Massive Open Online Courses (MOOCs) will then guide us as to where support units are situated and how their activities are framed within institutional arrangements in HEIs in Norway. In our analysis, we explore how our informants experienced their innovative work within pockets of innovation, followed by a discussion of the findings pertaining to implication for pedagogical practice and a strategy for digital maturity.

1.1 The Landscape of Online Course Design

Online course production is a joint effort. Faculties, who produce online courses and teach online, typically draw inspiration from long traditions and experiences with (1) educational practices, first as student and later as lecturers (Black & Wiliam, 2001), and (2) affordances provided by current technological infrastructure in the organization. Staff in support units more typically draw inspiration from technological development and open platforms and find inspiration from outside the organization. Pockets of innovation develop from the synergy of these contributors.

Through adjustments in existing institutional arrangements and entrepreneurial activities, the gap between traditional courses and study programs on campus and platform-based equivalents online is gradually diminishing. With this, a new language to conceptualize the educational landscape has emerged. For example, the form of delivery of a course may be described as *flipped*, *blended*, *hybrid* or *fully online*. User friendliness may be described

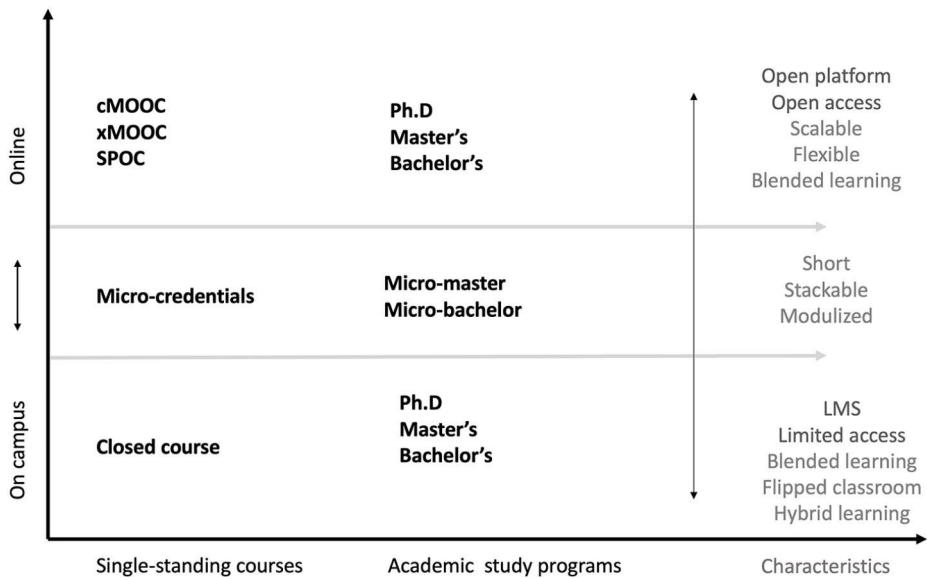


Fig. 1 Overview of courses online

in terms like *open access*, *flexibility*, *stackability* and *modulization*, while the concept of *scalability* is more alluring to new business models and democratic access to lifelong learning. Various combinations of *synchronous* and *asynchronous* teaching and learning serve to broadly draw this new landscape. In Fig. 1, we have displayed some of the many concepts that have emerged to describe education in HEIs and beyond since the New York Times declared 2012 the “year of the MOOC”, and online teaching and learning on open platforms took off.

In brief, the first groundbreaking Connectivist cMOOC made collaborative learning with no set objectives and learning outcomes available to learners worldwide (Siemens, 2004). In response, the Extended xMOOC made campus courses in HE scalable and available to large groups of students online. These courses were mainly asynchronous and linear, and the design was often based on traditional university course formats, mostly lectures and self-study (Ebben & Murphy, 2014). In continuation, the Small Personal restricted Online Course SPOC, was an effort to make asynchronous learning more synchronous, personal and social (Guo, 2017). The Blended learning bMOOC merged synchronous content on campus with asynchronous content online, providing a range of opportunities in pedagogical design (Langseth & Haugbakken, 2016; Haugbakken & Langseth, 2019; Jacobsen, 2019; Langseth et al., 2018).

A more recent move is the emergence of *micro-credentials* in the European Commission’s policy documents (EC, 2020; EC, 2021). Micro-credentials can generally be defined as short units of learning with the possibility of earning a certificate of achievement (cf. accredited course/ECTS) or a badge (cf. non-accredited confirmation of learning) upon completion of a course (Brown & Mhichil, 2021). These short courses target both registered full-time students and part-time learners. A common denominator is the relatively fast production of these courses to respond to changing societal demands for learning upgrades.

Adjusting the organization to facilitate the production of micro-credentials, also in collaboration with other universities, challenges established institutional practices (EC, 2020).

Inspired by this landscape, MOOC entrepreneurs seek to build capacity for fully online learning to address current educational challenges. We define *MOOC entrepreneurs* as staff and faculties, who collaborate on the production of MOOCs, micro-credentials and online courses. Positioned in pockets of innovation, they explore the affordances of open platforms, digital pedagogy and forms of online delivery. Through their entrepreneurial activities, they contribute to digital maturity in their own organization and disseminate ideas to others.

2 A Theoretical Perspective on MOOC Entrepreneurs

We have outlined the current research literature to frame how MOOC entrepreneurs in the Norwegian HEI sector engage with online education and capacity building in spaces where maneuverability is limited. To this end, we have drawn on two research streams to explain and contextualize the notion of *pocket of innovation*, which we defined above. The first research stream that we will point out is Institutional Entrepreneurship theory in organizational research. The second stream relates to an emerging horizon where researchers explore MOOCs mainly in a Norwegian context, and in particular studies focusing on support units engaged in MOOC production. In combination, these research streams will position our study and point out our original contribution to the research literature.

2.1 Institutional Entrepreneurship and Digitalization

Institutional Entrepreneurship is a research tradition in New Institutional Theory which, when used in organizational analysis (DiMaggio & Powell, 1983; Meyer & Rowan, 1977), aims to explain how actors or *institutional entrepreneurs* act to change organizations or organizational environments. Institutional Entrepreneurship is defined as: “activities of actors who have an interest in particular institutional arrangements and who leverage resources to create new institutions or to transform existing ones” (Maguire et al., 2004:657). Institutional entrepreneurs have also been defined as *change agents*, who deliberately seek change by using various strategies in the practices and activities they perform (Battilana et al., 2009). In our view, the benefit of Institutional Entrepreneurship theory is that it allows us to apply a bottom-up practice perspective to understand the dynamics, effects, and consequences of digitalization in organizational life. In this study, we focus on the perspective of MOOC entrepreneurs. Surprisingly, very few studies have employed Institutional Entrepreneurship to understand the processes of digitalization, yet there seems to be a more recent change (e.g.: Piancatelli et al., 2020; Wallin & Fuglsang, 2017). For example, Wallin & Fuglsang (op. cit.) conducted a case study of health care startups working with digital technologies. They showed that the introduction of new health care technologies also requires entrepreneurs to highlight the effects of the emotional and cognitive processes pertaining to change. In fact, entrepreneurs must be able to project an organizational culture, and then construct a language that persuades and creates legitimacy for change and the implementation of new health care technologies.

That said, Institutional Entrepreneurship offers a range of detailed concepts and perspectives to grasp the activities and practices of entrepreneurs. Here, researchers have been

guided by Bourdieu's (1990) concept social field which also applies to our research. *Social fields* assume that actors can construct and engage environments, but also be shaped and formed by these environments, as they interact and compete over resources. The concept allows researchers to study power relationships and the subject position of actors. Thus, providing more accurate analytical tools to understand the room for maneuver where entrepreneurs operate. Organizational researchers have applied and developed the concept to study emerging (Maguire et al., 2004) and institutionalized social fields (Greenwood et al., 2002) introduced by entrepreneurs. These studies show that entrepreneurs must first establish their role and position in a field to gain legitimacy, and thereafter start the process of theorization of new practices to convince powerful stakeholders to adopt the new practices into their routines and values. In this regard, we will introduce social fields to explain how a MOOC entrepreneurial pocket of innovation is established, how new practices and activities are introduced and adopted by various actors, and how this social field expands before MOOC entrepreneurs run into interpretive struggles with more powerful stakeholder, thus preventing boundary expansion and maneuverability.

Studies on Social fields involve focusing on acts of resource mobilization (DiMaggio, 1988); how the field's subject position determines who an entrepreneur is; how entrepreneurs engage into types of exchange mechanism to maintain and sustain their activities and practices (Dorado, 2005); how one can distinguish between interpretive struggles among entrepreneurs when they challenge the power of institutional arrangements (Hardy & Maguire, 2008) and how actors attempt at expanding their practices and activities. These are important analytical aspects, which will guide our data analysis.

2.2 Research on MOOCs and MOOC Production

The second research stream underpinning this study, is an emerging body of studies on what we, for simplicity, have labeled MOOCs. Since 2014, several peer-reviewed articles and conference papers have used the MOOC-concept to explore new ways of designing and delivering online courses, implying that MOOCs take many forms when adapted into local contexts in HE (Littlejohn & Hood, 2018). A main challenge is that very few Norwegian universities have contracts with open platform providers such as Coursera and edX. Only the Norwegian University of Science and Technology (NTNU), the University of Oslo, and the University of Bergen, have, for example, supplied ready-made and scalable online courses on FutureLearn. Other online courses promoted as "MOOCs" are regular university courses with strict enrollment requirements and offered online on closed and local LMS platforms. A reason for this, is that Norway still lacks a national platform for open online courses, which now appears to be common across European universities.

In the early stages of the MOOC wave (2014–2016), educational government agencies funded the development of early MOOC inspired projects with small grants (Koch, 2017). This funding has later increased over time. Some universities, like NTNU and the University of Oslo, have also internally funded MOOC inspired projects. At the start of the 2020s, new educational programs have been created to fund so called 'flexible' and 'decentralized education' projects. These often combine online and campus pedagogy and has life-long learning as a political objective, meaning that the initial MOOC discussions have now expanded and include many variations.

What we have described above, has also been researched in a bird-eye view on *organizational conditions*. For example, some studies question whether a separate Norwegian MOOC model can be distinguished. Researchers (Tømte et al., 2017, 2020) point out that Norwegian MOOCs tend to be influenced by local and national discourses, as policymakers influence course development through strategic funding. As a result, online courses with a MOOC label are often offered on closed platforms (LMS). Challenges pertaining to the implementation of MOOCs on open platforms are often stressed, as MOOC entrepreneurs are facing internal organizational barriers at their universities (Haugsbakken & Langseth, 2017).

The second body of research, which is not limited to the Norwegian context, goes deeper into *frameworks* and *learning designs* in MOOC production processes. By and large, we can observe that certain Norwegian studies do suggest learning design principles (Engeness, 2021a, b; Haugsbakken, 2020), but that they tend to align their theorizing with existing conceptual frameworks (Drake et al., 2015; Conole, 2015) identified early on that the key to reduce high drop-out rates, was to propose a new framework for different MOOC types and a learning design, the so-called *7Cs of Learning Design framework*. The challenge with these conceptual papers is that they do not address the operationalization of MOOC production and the role that faculties and support staff, as well as support units, play in these processes. It follows that knowledge about how a support unit for MOOC production emerges, is largely deficient, but also that a growing body of novel research might contribute to this knowledge.

Other studies focus on participants' *learning strategies* in online courses. Jacobsen (2019) showed that course completion is not always the motivation for taking a MOOC. Instead, learners are picky and select learning materials and activities to fit their own agenda. Studies also show that when faculties are absent in the running of a MOOC, learners tend to take over the "teacher's" role and become new facilitators and help other learners in the platform discussion fora (Singh & Mørch, 2018; Engeness & Nohr, 2020) found that students largely tend to engage with learning materials and follow a sequential learning trajectory suggested by the course designers.

Research on MOOCs also attempts at describing the operationalization of *teaching and learning online*. In this landscape, experienced-based papers are quick to emphasize that there is a plethora of available tools and guides on the Internet (cf. course templates, tutorials, hosting services, etc.), but that faculties do not effectively master such tools (Kerr et al., 2021; Wang Tinghuai, 2015). Early papers also stated that MOOC production is a creative and iterative process, where academics and staff in support units collaborate on various topics, such as online course design, video production, platform choice, revision, evaluation, etc. (Haugsbakken & Langseth, 2018). Engeness et al., (2020) have, for example, investigated the use of videos in MOOCs, where findings suggest that the use of videos support students' learning. Singh & Engeness (2021) have also studied how online teacher educators perform scaffolding strategies in synchronous video meetings in MOOCs to help student teachers clarify the learning objectives related to their final assessments. Studies in teaching and learning online seems to be established as an expanding trend.

Design-based models for MOOC production can be used in research on digital educational practices (McDevitt & Ricci, 2016). Theoretical studies on MOOC production show how this can be a complex undertaking with a potential for transformative capacity building (Johnson, 2021). For example, Kerr et al., (2019) conducted a study at a university where

they developed and researched the *MOOC design mapping framework*. Interviews with faculties and learning technologists showed the development of a deeper understanding of digitalization, as well as benefits and disadvantages of MOOC production processes. Czerniewicz et al., (2017) used Activity Theory to demonstrate that faculties, who produced a MOOC, changed their values and attitudes towards open educational practices. This body of research contributes to strengthening the general capacity for digital transformation in HEIs.

From an outside perspective, Norwegian HEIs can be described as digitally isomorphic, i.e., they tend to move in the same direction at the same speed (DiMaggio, 1988; DiMaggio and Powel, 1983; Tømte et al., 2020) to build capacity for the transition to digitalization of teaching and learning. However, from an inside perspective in a previous study, we found major differences in the institutional approach to encourage MOOC entrepreneurship and facilitate and organize support for fully online course offerings (left out for review). Operationalizing a systematic framework and a learning design in support for faculties who embark on developing fully online courses, such as MOOCs and micro-credentials, seems to be a question of both entrepreneurship, research and strategic and institutional leadership (Selznick, 2011).

In sum, we find that there are three issues under debate. One relates to how to produce MOOCs, what characterizes a “good” MOOC and what educational benefits can be drawn from the development of fully open online courses. In the research literature, MOOC development is different from creating an ordinary course online; it is a complex entrepreneurial undertaking demanding time, effort, and resources. In this scenario, a researched-based framework and learning design for online education is imperative. The second issue relates to the importance of efficient support units with capacity to support faculties, inform stakeholders and engage in entrepreneurial activities to move digitalization forward. This area seems currently scarcely researched. The third issue relates to how digital development and MOOC production can support the development of digital transformation in HEIs. A knowledge gap in current research is related to factors, conditions, and resources that contribute to resource mobilization enabling capacity building activities for MOOC production. In this context, Larger organizational perspectives that contribute to strategy, leadership and policy development are essential. We find such perspectives in Institutional Entrepreneurship.

3 Method

A starting point for this study was our work in an internally funded project on online learning (2016–2021) closely connected to a support unit at our own university. The university decided to stop funding the project and the responsibility for the entrepreneurial and strategic development of online courses was taken over by staff under the management of the pro-rector for education. Our position in this research is that this led us to try to understand what our project had contributed and what the role of a support unit might be on a broader scale. A pathway forward in this research was to speak with the faculties who had received support from the project and ask them to describe their work on digital course production; how it was initialized, maintained and supported.

Table 1 Overview of data collection

Data sets	Informants	Period & duration
SAMPLE 1: Local sample	Faculties & support staff	Fall 2019
Five semi-structured interviews with MOOC producers from one large HEI creating online courses based on their academic field.	n = 6 Female (n=5), Male (n=1)	60– 70 min
SAMPLE 2: National sample	Faculties	Fall 2020
Eleven semi-structured interviews with MOOC entrepreneurs from ten HEIs occupied with support for online course production.	n = 11 Female (n=2), Male (n=9) -	60– 70 min
16 interviews at ten HEIs	Informants N = 17	2019– 2020

3.1 Sample Selection

We collected two sets of interview data. The first set of data was collected in fall 2019 and included six faculties at our own university. These local informants had been engaged in projects involving MOOC production and represented five different academic fields. Their involvement had been based on a wish to create high quality online courses aimed at fulfilling specific educational ends in their own departments.

However, from networking with other HEIs in Norway, we knew that similar projects were conducted in many institutions. Analyzing the data from the first sample, we soon realized that we needed a broader sample. Such additional sampling is well known from Grounded Theory, where researchers add data to answer questions that come up during analyses (Glaser & Strauss, 1967). This led us to expand our project and collect additional data. The following year (fall 2020), we recruited eleven additional informants from ten different institutions countrywide. This second group of informants comprised faculties and staff from various support units linked to our network around the country. Their role in these support units was primarily to back up various top-down digital initiatives. Out of their roles in the support units, they had also developed an interest in supporting a digital infrastructure for MOOC initiatives, develop research informed competence in technology and pedagogy and give support for online course production in their organization.

A common denominator for the informants in our two samples was an entrepreneurial approach and commitment to online course offerings. Thus, we generally refer to them as MOOC entrepreneurs. The 16 interviews with 17 informants (N = 17) from the two samples constitute the empirical foundation for this study (cf. Table 1).

A main criterion for the selection of the informants was strategic (Patton, 2015). We wanted to explore the role of MOOC entrepreneurs and support units in online learning. Thus, we needed informants with first-hand knowledge of the issue and purposefully selected informants involved in digital support and online course production. (cf. Table 1). To this end a random sample would be futile and our strategy was crucial to select an information-rich sample that would be suited to inform our questions. Such sampling strategies also go under the name of *purposeful sampling* (op. cit.). Purposeful sampling involves selecting individuals that are especially knowledgeable about the phenomenon or practice under study (Cresswell & Plano Clark, 2011). Through our nationwide network, we were

able to find suitable informants for the second sample. We contacted the HEIs by e-mail and asked them to recruit the informants according to our criteria.

3.2 The Interviews

Based on our field of interest, we designed two semi-structured interview guides. The first guide was mainly based on our experiences from developing and supporting online offerings, as the second also considered issues that came up during the primary analysis of the first sample.

We conducted the interviews in an open manner, but mainly based on these guides, the planned questions and the embedded subject matter. Yet, during the interviews, a main purpose was also to let the informants describe their MOOC activities and experiences as spontaneously and freely as possible, without disturbances or having our questions and follow-up comments as “straight-jackets” or interruptions. Hence, we constructed open ended questions designed to stimulate conversation and to elicit as much information as possible about the various projects and activities under study. Examples from the study could be “Could you describe your MOOC activities?” or “Can you describe the process that led to your first online course?” Can you describe the collaboration between the support staff and faculties? “What stoppers did you encounter on the way?”. Through this open-ended strategy we hoped to uncover processes and approaches among MOOC entrepreneurs not previously described in the literature (cf. Kvale, 1996; Patton, 2015). However, an open-ended strategy also meant that we could not plan many of the follow-up questions or clarifications in advance and decisions to follow up on leads had to be taken “on the go”.

The timeframe for each interview was about 60–70 min. With consent from the interviewees, we taped and transcribed each interview. Because we had an English-speaking researcher on the team during the collection of the first sample, these interviews were conducted in English. The interviews in the second sample were conducted in Norwegian, which was the informants’ first language, and later translated to English. Both samples were transcribed verbatim yet omitting hesitations and pauses. Obviously, presenting the results, we have anonymized all individual contributions, and to further protect the informants’ identity we have avoided any detailed descriptions that could identify them in their work environment.

3.3 Analysis and Interpretation

Following the transcriptions, our next step was to code the interview data in NVivo and to develop the main categories representing the informants’ statements. Thematic Analysis (Attride-Stirling, 2001; Braun & Clark 2006)) describes the main purpose of coding as a process where researchers identify important themes from the interviews. Thus, from the initial raw codes, they encourage researchers to go on to identify important patterns in the informants’ contributions and to develop and refine these into an overall story describing the data.

As mentioned, there was a first analysis of the first sample, where we learned that we needed a larger sample. This first analysis also informed the development of the second interview guide. In the second analysis we compared the new data with what we already found in the first sample and the goal was to describe both differences and new phenom-

ena. The informants were also compared to each other to find how their experiences overlapped or differed and to saturate and deepen the categories as the analytical process went on towards an overall narrative describing the phenomena we studied. This strategy is known as constant comparative analysis (Corbin & Strauss, 2014; Cresswell & Plano Clark, 2011; Glaser & Strauss 1967).

3.4 A Note on Validity and Generalizations

In the analysis our goal was to keep an open mind and learn from the informants. Thus, our analysis can also be described as an inductive approach. Inductive analysis is a hallmark of qualitative methodology and is frequently used in both Grounded Theory and Thematic Analysis. A challenge in inductive analysis is that the researcher can influence the findings and jeopardize the validity of the research. Thus, it is often recommended that more than one researcher is involved in the coding process (Charmaz, 2001). In this study, two of the researchers collaborated to analyze the data. No analysis can be unbiased, but we contend that such intercoder reliability (cf. O'Connor & Joffe, 2020) combined with the transparency stemming from elaborate descriptions of the data, strengthens the internal validity of our results. Yet, we have not made any specific attempt at calculating the intercoder reliability since this is besides the scope of this study. Internal validity addresses the accuracy of the data (Kolb, 2012) and the analyses, as external validity addresses the areas of reliability and generalization. The goal of qualitative studies is, however, to discover and collect unique understandings of phenomena and events and generalizations depend on whether the findings and their context are comparable with other cases (Kolb, op. cit.). According to Kennedy (1979) such comparisons can be made similar to how doctors or lawyers compare their cases with previous cases that are described in, for instance, medical journals or court records. Generalizations from one case to the next can be made when users of the research recognize sufficient similarities. An outline and example of the process from interviewee statements to condensed categories is provided in Table 2.

The research project has been approved by the National Centre for the Handling of Research Data in Norway (NSD).

4 Findings

Our findings illustrate capacity building among MOOC entrepreneurs grouped in five themes that came out of the analysis. We aim to explore how MOOC entrepreneurs engage in various entrepreneurial activities and practices and to display a pattern of an emerging social field in institutional contexts in Norwegian HEIs. In these contexts, we found that MOOC entrepreneurs operate in what we have labeled “pockets of innovation”, where they have a certain room for maneuver to innovate education and create MOOC activities and practices. To show different aspects of what happens in these pockets of innovation, we apply the previously described concepts from Institutional Entrepreneurship.

Table 2 Coding of entrepreneurs' statements in interviews

No	Entrepreneurs' statements in interviews	Codes	Condensed label (Category)
1	<p><i>...and I really wanted to test out Open EdX, because I had heard that Google was going to get involved in online teaching and that they had chosen Open-EdEx as their platform. An then I figured, "we can just as well be the first in Norway".</i></p> <p><i>Early on, we wanted to explore a new way of teaching and learning, which was called MOOCs, something different from the LMS that we were used to. We were curious about how to design such courses [...] we just went for it.</i></p>	<p>Initial interest in new technology</p> <p>Initial interest in digital pedagogy</p>	Locating the MOOC entrepreneurs in pockets of innovation
2	<p><i>We contacted the support team because we were wondering first, what kind of platforms you offered support on and whether the institution had already negotiated formal agreements with these platform providers.</i></p> <p><i>And then number two, did the support team have any pre-existing courses that we could use as a model to base our course on. Then, I had an idea to make a digital course for them, so that we had a minimal standard for our tutors. That was the reason why I contacted the support team member one summer, in my summer holiday.</i></p>	<p>Request for support on open platforms</p> <p>Request for model course</p> <p>Request for support in online course production</p>	Entrepreneurial agendas in evolving pockets of innovation
3	<p><i>And we didn't understand really who had the responsibility for what and why. And it was a kind of conflict between the different support groups. We were really disappointed, ...</i></p> <p><i>... it is the case that the professional community comes in, they want to do this and that, and then we are happy to meet them, then we are happy to line up with someone who has MOOC responsibility. Now and then, a type of IT educator as we call it and preferably someone from the production environment then, to in a way talk themselves into, what is it they want to achieve, what plans do they have and then start shaping the support.</i></p> <p><i>...but we do it like... We don't find one specific tool and say, "this is what you're gonna use". We try to find as many tools as possible that we can be put together in external projects, or projects from the various departments, tools that will help them solve what they are after. So, it's like tailor made for almost every project you take on.</i></p> <p><i>...they obviously see the value of someone who is not necessarily only a technologist, but rather designers, course developers and who supports them in designing their courses. This is help that they have not experienced previously. And we try to bring with us important aspects of things that we have learned through the years to help them so that they don't make the same mistakes as we have. So, we're able to argue for this course and against that one and encourage more creative thinking. So no, the academic environments are definitively positive.</i></p>	<p>Loosely defined roles in support systems</p> <p>Exploring possible sources of support</p> <p>Ad-hoc project-based approach</p> <p>Positive response from faculties on support</p>	Scaffolding support for initial course production
4	<p><i>What is specific here is the model we have created to publish. It is based on people taking a course of 50 h on how to make teaching materials (MOOCs).</i></p> <p><i>We modeled our support on the information we got, and we tried to adapt our support to the local context. Leaning on our own expertise in pedagogy, assessment, coaching and teaching, we decided to learn from producing our own micro-credentials and MOOCs, before we systematized the support in a MOOC on MOOCs.</i></p>	<p>Offering campus courses for MOOC producers</p> <p>Offering online and blended courses for MOOC producers</p>	Towards systematic support

Table 2 (continued)

No	Entrepreneurs' statements in interviews	Codes	Condensed label (Category)
5	<i>But it is more about time, resources and means to do it. I think that a stopper may be that a faculty will get no reward to do it (a MOOC). This way, it indirectly stops from above. However, I don't experience any resistance, but it is like.... maybe more like what can I get for it? Why should we do it. Eventually it is about prioritizing. There is something that is not working well yet, and that is a responsibility throughout the whole line of management.</i>	Lack of support from leadership	Expanding beyond pockets of innovation?

4.1 Locating the MOOC Entrepreneurs in Pockets of Innovation

The first theme in our data analysis establishes the subject position of MOOC entrepreneurs. We consider these entrepreneurs as early adapters of open platforms, recent pedagogical ideas and new technologies in education. The analysis also establishes the location of the MOOC entrepreneurs in the institutional contexts. This provides a clearer understanding of where pockets of innovation can be found in HEIs. Instead of using the properties of a person to distinguish an institutional entrepreneur from other actors, our analysis suggests that a MOOC entrepreneur can hold at least four different positions in a social field.

A MOOC entrepreneur can be: (1) an entrepreneur working by himself or herself, (2) a person who is part of an ad-hoc and project-based initiative where the aim is to develop an online course, (3) an individual or group of people who are loosely coupled with some formal “goodwill” at strategic levels at universities and (4) an individual or a group of people who are more formally affiliated to formal structures like a center or department providing support to educators and administrative staff. From these positions, we see the initial stages of MOOC entrepreneurship. The MOOC entrepreneurs are *active* actors, who mobilize resources, make room for and spend time to form alliances to reach their goal. Their approach is mimetic, in the sense that they are inspired by national and international MOOC actors, as well as policy documents, and find room for maneuver to explore the phenomena and MOOC practices in their own contexts. A common denominator is self-initiation, in the sense that they explore new ideas, lead themselves and find co-workers, who are interested in the new ways of thinking, acting, and organizing online education. Below we contextualize the four subject positions of a MOOC entrepreneur.“

4.1.1 The Four Subject Positions and Their Organizational Context

In our study, some of the informants described a *self-organized approach* to competence development in the field of MOOCs and online learning. They teamed up in informal networks in their organization to explore their own room for maneuver. In some cases, they even did this outside their work plan and mandatory hours. One informant described the competence building as an occupational and self-motivated “sidetrack”. The interest in MOOCs was rooted in technological curiosity, a desire for skills development through hands on experience with the technology, and timely collaboration with other faculties in their field. These initiatives resulted in a growing number of ad-hoc deliveries of online courses over the years. An observation was that despite lack of strategic decisions at higher organizational levels, the informants had pursued their own competence development for

about 10 years. This happened because the organization gave room for individual maneuver, and because leaders at immediate levels to some extent supported the initiatives. When asked to pinpoint elements of success, the informants generally referred to a bottom-up strategy and informal networking. One informant explained the work as follows:

We have no funding from the university to do this, we have no allocated time to do these things, it must be done in addition to everything else. So, it is successful in the way that we can use open platform technology and are able to set aside some time with acceptance from our immediate leader to do these things, to develop and to play our way to learning things.

A second group of informants described a *project-based* digital competence development strategy in their organization. Here, the informants typically went from one project to another in a management strategy commonly described as *top-down* (cf. single loop learning in Andreassen et al., 2010; single loop entrepreneurship in Langseth et al., 2018). One typical informant described how the initial interest was created when new technologies made it possible to think about teaching and learning in new ways in teacher education in the 1990s. In 2013, upon the initiative of a prominent professor, the informant joined a small group of entrepreneurs located across organizational departments in the organization. Their ideas were formalized in a project proposal and internally funded for a period of 3 years from 2014 to 2016. Upon the initiative of the pro-rector for education, the project results were refunded in another project period of 5 years from 2016 to 2021. The informant described the funding as a very personally rewarding top-down initiative with possible implications for strategic decisions regarding future education in the organization. That said, the informants also voiced a general tendency towards frustration concerning the uncertainty of the outcome of the project results in the organization after the project period ended:

The local and self-organized course production process provided us with the necessary confidence, knowledge and skills to opt for the global market, and FutureLearn. Since the start, we have produced and run many online courses ourselves, mainly targeting digital competence development in higher education. [...] It has not been easy to reach an audience outside the project and the people who have made use of our support. [...] Reflecting on our experiences through refereed articles has also deepened our understanding of the importance of leadership involvement and the broader implications of online education in transforming education at universities. We have not succeeded outside our project, I am afraid. [...] one applies for funds for the development of operations (online courses), and when the money disappears, the offers disappear.

Informants from two larger organizations described a dual *adoption* process to change. The initial change agency led to hands on experiences with MOOC production in local contexts. Then, they also collaborated with leaders and management to anchor and legitimize the initiatives at strategic levels. One informant described the experience from participating in these dual adoption processes as follows:

It probably started in 2013, I think. [...] We also researched it (MOOCs), it was a way to start the anchoring work, to get people on the team, a bit like how we proceed with it. On the one hand, it is about getting teachers interested, you go out in the organization and then find if you have someone, [...] you start a dialogue there. The other direction, here you must also go a bit in the direction of management, in the formal organization and the ones who can make decisions on it (MOOC). So, in 2013-14, I participated in that process, briefly explained, in the end, it (MOOC) ended up in the academic line then.

Similarly, other informants pinpointed a strategic reorganization of the support units at management level in their organization to facilitate digital transformation. However, the room for maneuver for MOOC initiatives was still limited in terms of legitimacy and online education at scale. One informant described their more recent reorganization in a new location as a promising initiative:

After we moved into [mentions location], we have become more closely connected to the pedagogical environment, the learning support environments and the further education environment. [...]. The working community has been something that has been baked together on the way then. [...].

A few HEIs had established an independent “center” that was more loosely connected to traditional institutional arrangements. For instance, one HEI was private of sorts and not eligible for stately funding. Seemingly, they were more proactive in their response to societal and professional demands for lifelong learning (e.g., course portfolio, business models, student centering). The informant also described the whole organization as a coherent effort. The informant defined their work as an integrated and legitimized strategy in the organization, omitting the commonly found dichotomy of MOOC entrepreneurs as “us” and leadership/management as “them” among other informants in this study. Rather, they described a coherent strategy for online course offerings:

And we have never had that problem (vaporizing project results), because it has been anchored in the line. Everything that is developed lies in the strategy, it is budgeted with operation for a long time, and it is in a way what is lucky for us then, that we are experienced in the (online course) field. And it remains a high priority in all strategies. And there is also an ambition that it (online courses) will be taken further in all subjects. So, it is very much rooted in our strategies.

To sum up, we found different stages in the development of subject positioning regarding MOOC entrepreneurial activities. Some MOOC entrepreneurs were only loosely coupled to their organization, others were connected to leadership and even institutional strategies. The overall pattern locates MOOC entrepreneurial activities *in pockets of innovation* across institutional arrangements and describes different stages in institutional entrepreneurship, as new ways of thinking, acting and organizing education online emerge.

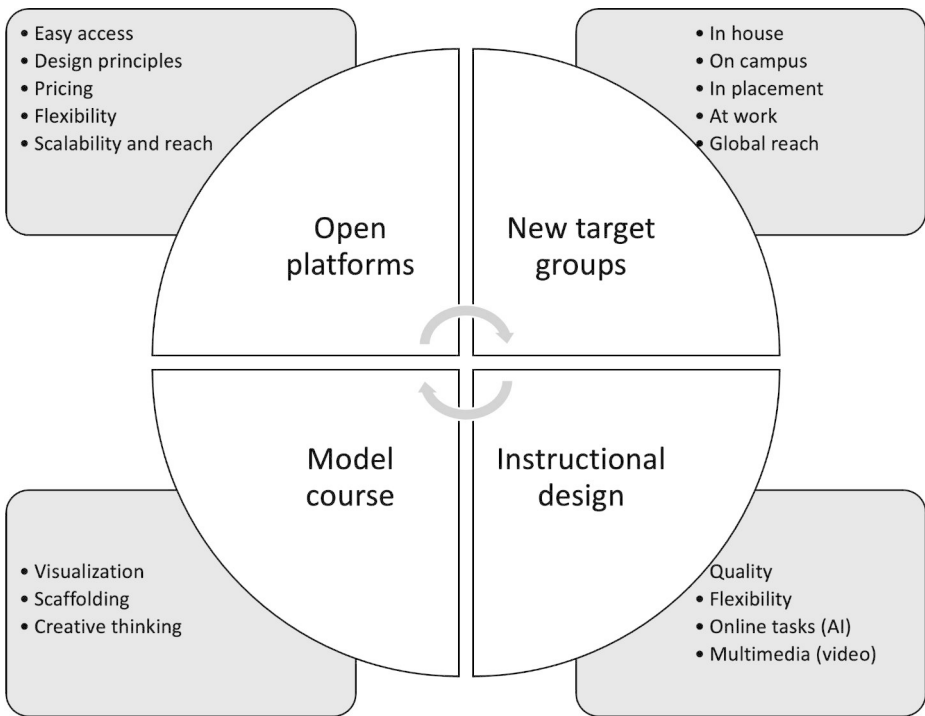


Fig. 2 Overview of queries for support PS

4.2 Entrepreneurial Agendas in Developing Pockets of Innovation

The second theme shows the development of the pockets of innovation. Pockets of innovation develop as MOOC entrepreneurs mobilize resources; find new alliances, explore new practices and activities to support MOOC production. An overall pattern in our data is the clear emergence of more detailed concepts and new knowledge about what MOOC production means in practice. Such concepts are displayed in Fig. 2. The development propels forward as new MOOC entrepreneurs enter the social field and query about MOOCs. An important push factor is that the conditions for MOOCs in the formal arrangements in their organization are non-existing. When more MOOC entrepreneurs enter the social field, they form new alliances. They work together and develop new knowledge and skills. Below we will demonstrate how pockets of innovation develop by showing the pattern of an emerging social fields.

4.2.1 Mutual Dependency Among MOOC Entrepreneurs

An overall finding was that the faculties' idea of an open online course had *migrated* from other MOOC entrepreneurs (cf. theme 1) in their organization. Hence, they formed *alliances*, as a *mutual dependency* between support teams and faculties emerged in the course production process. New knowledge was co-produced, as new questions were asked and new perspectives and contexts for online course design emerged.

As to why faculties contacted support teams in the first place, informants (n=6) typically reported that they had been granted project funding prior to collaborating with the support team:

When we first contacted the support team, we had just received funding for our project, 2,2 million EURO. And our idea was that we wanted to build a professional development course for our teacher educators, because we see that they need to develop professional digital competence. We were looking for technical solutions available.

We also found examples of informants contacting the support teams in the project proposal process to develop a budget for variable and fixed costs in the course production and the first course run. Likewise, faculties were sometimes contracted by the support team (cf. center) to produce online courses offered as further education/lifelong learning. We also found a few examples of faculties contacting the support teams on an individual basis to query about MOOC production in general.

Having established the initial contact between faculties and support staff, an overall finding was that faculties queried for *different kinds of support* in online course production. In Fig. 2 below, we have summarized the need for support in four categories. Those were: (1) the need of an *open platform* providing easy and open access in an inviting design for a whole range of students, (2) the need of a *model course* to explore the affordances of the platform; what an online course design could look like, (3) the need to reach *new target groups* that could not easily be reached on campus, due to their geographical location or their work schedules. (4) The need to learn about *instructional design* in online environments to ensure quality and optimal use of learning resources.

The informants (n=6) typically reported on the need of an *open platform*, in contrast to the closed LMS to cover their needs:

We contacted the support team because we were wondering first, what kind of platforms the support team offered support on and whether the institution had already negotiated formal agreements with these platform providers.

Informants also required *modelling*, a MOOC that they could explore to model and scaffold their own course in creative ways:

And then, did the support team have any pre-existing courses that we could use as a model to base our course on?

And we thought, this is quite like... designed very elegantly, ...it seemed like it was very intuitive to use. And visually, it was pleasant for the end users. So, we decided that we wanted to go with that one, even though none of us had any experience with this particular platform.

Another informant (n=6), referred to a problem that she had been pondering for a while and thought she could solve through an open online course. The problem was related to developing *quality* and an expected standard in the mentoring (tutoring) of undergraduate students in remote clinical practice.

We try to visit them once during the three years they are students with us but, there is great variation in their knowledge about tutoring. [...] Then, I had an idea to make a digital course for them, so that we had a minimal standard for our tutors. That was the reason why I contacted the support team [...].

Similarly, another informant (n=6) contacted the support team to facilitate an online mentoring course for pre-service teacher educators in schools, primarily to enhance quality and accessibility and compensate for their long and expensive travel distances to campus. The informant had already experienced a MOOC provided by the support team and wrote her own MOOC into the Ph.D. application, which was later accepted:

I thought that we must do something. But, we have a problem getting them [the mentors] to come to campus. We have pre-service practice in schools from, I think it's 500 km north and 300 km south (of the university). And they can't come to campus because it's too far and expensive to go by plane for the schools furthest away, also, it is expensive having other teachers taking their place (classes) when they are away.

Informants (n=6) typically requested help from the support team to produce *videos* and *visuals* in their online course, often disregarding the researched-based function that these multimodal elements have in the *instructional design*. Also, videos and animations are often quite time consuming, for example when filming on location. Informants (n=11) typically reported that they “had a generally high demand for video production from faculties”, including MOOC producers, which often put a strain on their resources.

We wanted animations or something [in the course]. And so, we had that as a request for visuals. And then we talked with... [mentions name] and he worked with ... [mentions name] and they made the films and the symbol, the figures and the animations that we are using.

A general observation was that informants (n=6) with no experience from teaching in HEI, seemed to be less prepared for the work involved in online course production:

It came as a little shock that we were the ones who were going to do the job on the course, so you really hoped that it was just the kind of magic, like somebody could just feed in [the content] and look at the facts or put some kind of cool IT-guy with the pants far down to work, somebody should help us with all that then.

4.2.2 Limited Feedback from Other Faculties and Stakeholders

In the analysis, we also looked for elements that were mainly carried out among faculties, without much involvement from the support teams, meaning that they tried to extend their network locally or externally. Most informants (n=6) worked on subject *content* in teams in their local academic context and some also involved the target group in the initial stages to make the course as relevant as possible. Others piloted the course to receive feedback from

colleagues and students. Piloting, as one informant described, could be a long and tedious process when people outside their local team were involved:

Yeah, it's interesting because we tried to pilot the course the first time. We selected some of our experienced external tutors to give us feedback. That was the most interesting, because they didn't find time to do it. [...] Again, I had no feedback from them. [...] Then, we asked some of our internal teachers to take the course and give us some feedback. Then, we actually got some feedback and made some changes in the course.

One informant (n=6) also reported on a lacked support from faculties to assure content quality in the course, something that the support teams were unable to provide without subject knowledge in the academic field:

So far, it's been me, this is my baby. And then my colleagues, they haven't read through the manuscript I have sent out, can you give me some feedback? Is this OK? Should I add some more? But I don't think they even read it because they don't have time. I needed this feedback, because it is important that it is something I've invited them in meetings, but also sent them documents, but I haven't got any response. So, surprisingly alone because they all said yes, do this and it's important and we really need this.

In general, we found that the informants (n=6) were happy to find answers to their initial queries in the support teams. They got access to relevant information and formed alliances that could scaffold the course production process. The informants described the first MOOC production as an exciting, but challenging journey, while those involved in consecutive MOOC productions raised questions related to time, effort and merit in their organizations. That said, the faculties who contacted the support teams, were often self-motivated, willing to take a trust-leap and generally excited about the tangible results they obtained in their first MOOC (n=17). Hence, these faculties showed similar characteristics to those found in the support staff, already described as entrepreneurs in their online approach to education.

4.3 Scaffolding Support for Online Course Production

The third theme describes how the MOOC entrepreneurs manage to establish more organized and structured approaches to MOOC production from the resources that they have managed to mobilize. From within the pockets of innovation, the MOOC entrepreneurs scaffold new organizational support structures for online course production. In the process, they introduce new workflows and approaches that are foremost dependent on hands-on experience and collaboration. We see patterns of exchange mechanisms based on mutual dependencies emerge, as faculties collaborate with support staff in new online course production teams. In the process, the MOOC entrepreneurs mutually benefit from complementary competences residing in the teams to establish new practices for MOOC production. That said, the educational novelty that they represent is not always flawless. In fact, the support teams generate tension in institutional contexts and can sometimes compete with other actors, who also work with campus pedagogy, but where different logics are at play. Moreover, we observe

that the support teams can be ineffective and not able to cope with the demand for support for online course production. Such aspects will be demonstrated in the paragraphs below.

4.3.1 Teamwork Across Institutional Arrangements

MOOC entrepreneurs consisted of two groups. The first group, the support staff, had the provision of a digital infrastructure – an open platform – as a main issue on the agenda. A concern in most cases was to develop research informed competence on digital technology and pedagogy and provide *support* for online course production in their organization. The second group, entrepreneurial faculties, had the production of online courses of high quality to fulfil certain educational purposes in their institutional contexts as a main goal on their agenda. Course production processes usually lasted for a period of 6–12 months, involving some 3–7 active participants from both groups.

The complementary competences residing in these pockets of innovation scaffolded the production process. These competences typically involved resources in the fields of pedagogy and instructional design, open platform technology, multimedia production and academic expertise. Some support teams were also staffed to produce their own accredited courses, while others were not. In the process, driving forces were typically coaching, mentoring, apprenticeship, timely feedback and networking, both on campus and online. The aim of the activities ranged from the provision of MOOCs, micro-credentials and online courses for a wide range of students, to upskilling or reskilling of academic and professional competences for lifelong learning, solving interdisciplinary educational challenges across institutional arrangements and providing internal competence development in the organizations.

We also found that institutional arrangements of the various support units could be incoherent and even competitive. Faculties got confused about where to go for MOOC support. Two informants (n=6) described their initial encounter with the support system as disappointing. They even detected a certain strain in the relationship between the different support units operating in their organization:

We requested a meeting with the different support units at the university. I think this first meeting, we met a lot of people. It was good because there were so many who were interested in what we're doing and very positive and very interested in helping us. And we didn't understand really who had the responsibility for what and why. And it was a kind of conflict between the different support groups. We were really disappointed, because we had sent an application and also a short version of it to everyone or to the organizers of the meeting. So, we expect that people were prepared. (...) I expect that if I have sent some documents, I expect people in the meeting to have looked at it.

4.3.2 The Different Roles in the Production Process

One main observation was that the support teams, to a variable extent, *scaffolded* the course production processes, meaning that the need for support during course production depended on the technological and pedagogical competences residing in faculties. Moreover, some

informants (n=11) reported that many faculties in their organization were not open for change and that they tended to build too much on previous experiences from teaching. The faculties wanted a “quick fix” for online course production. The lesson these informants had learned was that it was necessary not to take faculties’ competence in online course production for granted. As an effort to limit the controversy between different logics in the organization, one institution did not support faculties unless the support team was listed in the project application as an equal partner.

Similarly, and to avoid misunderstandings due to different institutional *logics*, support staff also learned to clarify the *limits* of their support and the amount of work involved for faculties. One informant (n=6) described the production process as quite different and more demanding than they initially expected:

The dream was to make the content available in a more interactive way. We did not understand how different a MOOC is. I think we had no idea about the process and how different the whole learning design is from just reading a book. So, it has been such a hard experience in many areas, not only the production of a course but what an online course is and how it can be used, the whole pedagogy. The fact that it can exist independently online has been a steep learning curve in all areas for us.

An overall finding was also that the capacity for support (cf. budget and staffing) framed the level of activities in the support team, while the level of competence residing in the faculties framed the different levels of technological and pedagogical support needed. The support teams tended to *adjust their support* in each case. One informant (n=11) also reported that their organization never adhered to the academics’ interests in course production without checking for the sustainability of the course in the market.

At large, the informants (n=11) were involved in *technological support*. They provided an open platform and played a major role in maximizing the affordances of the platform. A general view was that many faculties needed support to develop and master the course run on the open platform. We found examples of references to faculties who were “stuck in the old ways”, and academics who had moved on to the “new mind-set” in their approach to digital technologies. The latter approach was also described as a goal in the support units. One informant reported that the technological aspect could be handled in the support unit, but that the pedagogical aspect – the instructional design – was much more complicated, since they lacked this particular expertise in their support:

One thing is the technological innovation, you get to work with a new technology that creates certain possibilities, but the pedagogical innovation, that is what often becomes rather complicated here.

All support teams (n=11) provided access to a *model course*, and some support teams reported that they made systematic use of this type of scaffolding in their support. In some support teams, faculties, who had already produced an online course, were often used to promote and present their own courses to other stakeholders. In the long run, this put a lot of strain on the few faculties involved, and they sometimes “overdosed”. A few support teams had also developed their own MOOCs and seemed better able to share their in-depth expe-

riences and to foresee where the faculties would typically run into problems in the course production process.

We have produced online courses for HEI employees as a target group, and I would say that we have been successful. Both because we have eventually reached a relatively high number of courses, and [...] we have also found a structure that I think works.

All informants (N=17) refer to *video production*, and to some extent animation and filming on location, as a central area of collaboration in the *instructional design* process. This was also described as a bottleneck in the production line: “when it comes to developing videos, most of the producers were too busy”. While the faculties often suggest content that they would like to turn into a video, the support teams generally provide the technological competence and some pedagogical support prior to and during the filming, as well as post-production (e.g., editing), which is often time consuming and costly. Moreover, we typically found that video production as a facility for faculties and staff had long been established in the organizations. However, many informants (n=11) reported that the video producers’ role was generally extended to the support of a more *pedagogical and coherent* video production in the instructional design, which seemed more demanding.

One needs an instructional design where you have a specter of content, where information is in the form of text and video and where you also integrate social learning activities as a part of the construct.

The informants typically reported on video as a new field to explore: a means to create variation in course content and to scaffold faculties’ experience of unease in front of the studio cameras for the first time. Likewise, faculties were happy to receive support:

*We use a lot of videos to create variation (in the courses). It (online course) easily gets very heavy text wise, ...
And I understand very well the change for many faculties when they have to stand in front of the camera and they have to say things briefly, to break things down and ...*

Most informants (n=11) reported that the support team was working very hard to contribute to the *instructional design*; the way the academics were thinking about teaching and learning, content and new target groups, on online platforms. One informant stated the general need for sensitivity and tactfulness in the collaborative activities:

... for a faculty who has a field that is interesting and would like to have it disseminated, I like to think that one quickly thinks that through the MOOC, the content will be simplified and too tabloidized in a way. That you must get into a different way of thinking and communicating that content. It is a job that is not finished. But you have to do it again and again.

The same informant also underlined a more general need for the support team to lead the *production process* to drive the production team forward.

In the first projects we were clear about taking the project lead responsibility, the administration. Since there are faculties in our support team, we have pedagogical and subject support. At the same time, we are clear about the need for a dedicated expert faculty to collaborate with us on equal terms. We are working across administrative and faculty lines, and it has generally worked well.

Faculties were, for example, particularly happy to receive immediate feedback:

Knowing that if we encounter any problems, somebody would be there at the other end, picking up the phone and saying, hey, this is what you need to do, or I'll follow up on this immediately.

In general, all informants (N=17) expressed a general satisfaction as to the *value* of the teamwork that existed in the MOOC entrepreneurial activities, however with some potential for improvement in institutional arrangements and capacity building.

4.4 Towards a Systematic Approach to Support

The fourth theme describes how the MOOC entrepreneurs achieve results in the pockets of innovation. Their activities are centered around the production of online courses. Many of the entrepreneurs organize structured and scalable approaches to support MOOCs and online course production on open platforms, like Moodle, Open edX and FutureLearn. In the pockets of innovation, faculty and staff co-construct the production of online courses. The support helps faculties to produce dozens of online courses each year. The number of participants in the online courses on the open platforms increases over time.

An overall finding is also that the MOOC entrepreneurs have reached various stages of capacity building within their complex institutional arrangements. One informant (n=11) described how a loosely coupled network of administrative staff at his department and the immediate organizational levels supported both online course production and digital competence development in an *ad-hoc* manner:

We have built a small network of sorts with a support function, so that each subject area has a person who can help them, but who is not formally employed to do this work. In the administrative staff, we have people who know a little and who contribute. We have also made use of student assistants to help us with the practical sides. We have video production equipment and staff, who have been filming on location.

Likewise, another informant (n=11) reported on the development of a *guidebook*, where instructional design and positive user experiences were shared to support the online course production process. The guide was based on personal experiences and students' course evaluations over the years:

It is more like a course plan, where you have a course. What we have found is that we have some principles that we have developed based on experiences and evaluations over the years, which is about how to set up courses so that they (students) can get the most out of it (the courses).

4.4.1 Developing Models for Scalable and Systematic Support

Two informants (n=11) referred to a more systematic approach to developing support for MOOCs and online course production. The first *model* consisted of a 50 hours' hands-on course offered on campus for groups of faculties who would like to produce a MOOC, followed by another 50 or more individual hours to finalize the course production. The course offerings were presented in a language borrowed from publishing, to underline the analogy to existing standards in research and text production (cf. intellectual property rights).

During these years we have had 200 people through these courses, we also have approx. 30 titles out now, and we have 27,000 registered users on the open platform, and 20 of them come from health sciences. The resources that have gone into this module are a combination of allocated time and the flexible opportunity that leaders close to the faculties, i.e., the head of studies and department levels, have managed to allocate. There are always resources in the system if you want, but in a way, you must have a small highway, you also must have many side roads. The evaluation [...] says that both the ... model and the ... course are good.

The second *model* consisted of organized team work on demand, where a small support team of 2–3 persons with the necessary competences in technology, pedagogy and video production was established to support faculties during course production. The team-based production process was later redesigned in a seven-step model. The model constituted the core content in a MOOC on MOOCs that was made freely available online. The idea was to cater for capacity building, i.e., consistency, flexibility, scalability and transparency, in the support team. The informants described the initiative as a systematic and research-based development over several years involving many faculties:

We initially travelled internationally to understand how the MOOC production process worked at other HEIs. We also collaborated with national parties interested in MOOCs. We modeled our support on the information we got, and we tried to adapt our support to the local context. Leaning on our own expertise in pedagogy, assessment, coaching and teaching, we decided to learn from producing our own micro-credentials and MOOCs, before we systematized the support in a MOOC on MOOCs. We are quite pleased with the result. Many academics have produced courses with support from us. On the open platforms, we have more than 50 courses and some 65 000 participants.

The informants that we were in contact with, all described systems of MOOC development support in pockets of innovation. An overall observation was that activities and processes carried out by the MOOC entrepreneurs were dissimilar, meaning that the staffing conditions that they worked under framed their possibilities to carry out research and systematize their support in research informed ways.

4.5 Expanding Beyond Pockets of Innovation?

In this fifth theme, we describe *boundary expansion*; how actors try to claim legitimacy outside their pockets of innovation, and the complexity involved in changing institutional strategies to transform education. We found that MOOC entrepreneurs often ended up in interpretive struggles over institutional logics when introducing new practices and activities in online education in their organization.

A major challenge among MOOC entrepreneurs (N=17) was to find platforms where they could reach important stakeholders outside their pockets of innovation. Stakeholders at higher levels needed to be informed about the work that went on to make qualified decisions about funding etc. To find platforms where the entrepreneurs could communicate their competences, experiences and tangible results to higher level officials was crucial to create a foundation for viable and lasting results.

It [MOOC production] has probably more to do with time, resources and means to do so. I think a stopper might be that a teacher will not get any special credit for doing so either. And in that sense, it stops indirectly from the immediate level then.

Several informants (n=11) referred to MOOCs that died when the project funding dried out. Additionally, they referred to projects that were externally evaluated, but where they were afraid that the reports could end up as “paper tigers”, meaning that “one knows that they exist, but no one reads them”. In spite of the enthusiasm that MOOC entrepreneurs showed: “I am very passionate about developing a coherent strategy for lifelong learning here”, an institutional strategy for an holistic and systematic *research informed support and quality enhancement* in online course production was often flawed or lacking in most HEIs in our study.

Several informants also referred to the transformative aspect of MOOC entrepreneurship as a complicating factor:

[...] the little work you do here, it challenges in a way the whole model that is safe and nice for the institutions.

Institutions may have many projects, but they do not always speak well together. We find loose coupling between the various educational initiatives. When digitalization is on the agenda, we detected opposition and lack of collaboration across organizational arrangements.

Then there has been an Achilles' heel. (...). So, we have had meetings with social studies and with management and everything like that, and there we have had a sub-project (mentions study program), but it was not so much, because there was relatively much opposition to digitization there.

The same informant (n=11) also expressed both positive and negative feelings about collaboration in his institution. While being happy to support one group of faculties, he uttered frustration about the lack of collaboration with another.

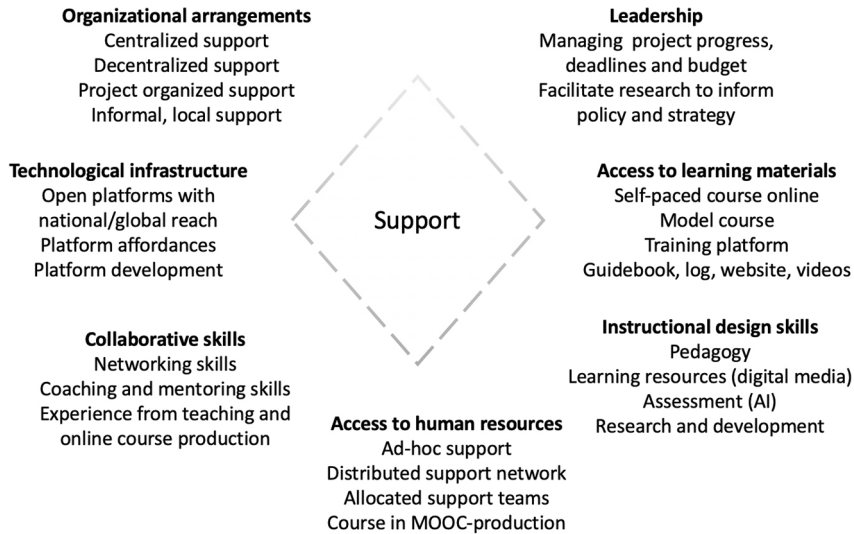


Fig. 3 Thematic areas in support for MOOC production

Now we are in good conversations with (mentions study program), and they have an urgent need for continuing and further education, and that platform and way of working suits them well. We have a head of department in teacher education sitting in the (support) group, but there has been a strong internal e-learning environment with own funding from the ministry for many years. So, they kind of run their race. You know how it is in academia. So formally they are involved, but in reality, we do not have much to do with each other. (...). So it's not just initiative from above and below, but also across.

In Fig. 3 above, we have summarized core elements in support for MOOC production resulting from the interviews (N=17). The support was located in pockets of innovation in the support units and the activities made up thematic areas (cf. theme 1–5). The skills and competences residing in the pocket of innovation in the organizations often consisted of a mix that provided the basic expertise for online course production on open platforms. Some pockets of innovation partly covered the skills and competences needed in only a few members. Others were limited to activities on closed platforms (cf. LMS) in their organizations. MOOC entrepreneurial activities were often only loosely coupled to organizational arrangements and leadership. This could for example mean that project results were poorly disseminated. Outcomes in the organization and change of practice, could, thus, circulate at a very slow pace, if any at all. The capacity building for digital transformation in education, therefore, seemed to run in cycles of 2–3 years (cf. single loop entrepreneurship in Langseth et al., (2021)). A significant finding, however, seems to be the thematic areas in Fig. 3. They stand out as important cornerstones in the composition of strong support teams for online education at managerial and leadership levels in the long term.

5 Discussion

Central to this study was the role of support units and how MOOC entrepreneurs build capacity for online teaching and learning across institutional arrangements. We focused on MOOC entrepreneurs operating in *pockets of innovation*, yet with a strong belief in their contribution to change and the improvement of quality in online education. Adopting the lense of Institutional Entrepreneurship, the study also focused on how stakeholders can benefit from entrepreneurial activities to build strong support units and capacity for digital transformation across institutional barriers in Norwegian HEIs. Such entrepreneurial experiences and activities may produce new operationalized knowledge (Blackler, 1995) that can, in turn, lay the basis for new management strategies and enhanced digital maturity.

5.1 The Role of MOOC Entrepreneurs in a Loosely Coupled System

In contrast, the organizations in our study seemed to be loosely coupled, in the sense that MOOC entrepreneurs and other important stakeholders tended to adhere to different logics that represent different belief systems, values and educational practices related to digitalization (Irgens, 2016). Our study suggests that Norwegian universities adopted new technologies and strategies associated with digitalization from an institutional context, governed by its own institutional logics and loose couplings. As MOOC entrepreneurs operationalized opportunities for change inspired by scalability and open access to education, top management and leadership often seemed to exercise a powerful influence in support of a campus-based educational policy and digital competence linked to the lecture halls and closed platforms (e.g., LMS). Sharing education as a free commodity could figure low on their agenda and even be perceived as a risky activity. Moreover, a diverse range of faculties and staff seemed to operationalize digitalization in educational practices with *uncertainty* and at variable levels of risk taking. (Fosslund et al., 2020). In our study, we saw the contours of opposing logics and conflict in the approach to digitalization and digital transformation. The opposing logics can be explained in conflicting adoption strategies for digitalization that propel organizations to appear similar, as explained in the concept of institutionalized isomorphism, which relates to rationalized myths (DiMaggio & Powell, 1983) and survival strategies that are taken for granted (Schutz, 1970) at higher levels in the organizations.

5.2 The Role of MOOC Entrepreneurs in Support Units

In this landscape, we found few examples of strategic and organizational change, as MOOC entrepreneurial activities were often marginalized in the support units and faculties were only sporadically supported at lower levels in the organizations. That said, MOOC entrepreneurs were *active actors* (Maguire & Hardy, 2006), who engaged in innovating educational activities and paved the way for online Education. They established *pockets of innovation*, where they operated as institutional entrepreneurs and change agents, yet with limited control beyond their pockets of innovation. They provided, for example, access to and technological support for open platforms. They also developed a pedagogy for online course design (e.g., MOOCs). In some cases, they carried out research on their activities. However, in most scenarios, MOOC entrepreneurs operated at lower levels in support units, where they still had limited impact on strategic decisions that could dominate the organization.

Aligned with other studies (Bygstad et al., 2022; Fosslund et al., 2020; Stensaker, 2018), we found that MOOC entrepreneurial project results contributed to the understanding of concepts linked to online teaching and learning and digital transformation (cf. Table 3). That said, our study also confirms earlier studies stating that digital transformation seems to be a buzzword that has not yet found its true meaning in education outside strategy and policy documents (Osmundsen et al., 2018). Additionally, digitalization can be regarded as a moving target, as students and lifelong learners develop digital competence and expect HEIs to follow.

5.3 A Typology of Key Concepts in Digitalization

Based on our findings, we have broken the concept of digitalization down into subcategories to develop a more granular understanding of the scenarios of digitalization that transpires in pockets of innovation (cf. Table 3). In the following, we propose a typology for digitalization that can also be seen as a taxonomy, as HEIs move towards digital transformation. In Table 3 we present four key concepts that emerged from our analysis: *digital competence*, *digital agency*, *digital transformative agency* and *digital transformation*. The concepts are defined and discussed in terms of the role that support units concerned with MOOC entrepreneurial activities play in online Education.

In the first scenario, support units often engage in top-down implemented technological infrastructures, where they contribute to *individual digital competence* development to maximize the effect of the investment. Digital competence is a relatively well-established term “grounded on basic skills in ICT, i.e., the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet” (Ilomäki et al., 2011:2). According to Ilomäki et al. (op. cit.) the concept has been described as political; reflecting beliefs, goals and possible future societal needs, and has its roots in economic competition where new technologies are regarded as an opportunity and a solution. In education, the concept has for example been contextualized in the Technological-Pedagogical-Content-Knowledge (TPACK) framework (Koehler et al., 2012) deriving from Schulman’s theory of “pedagogical content knowledge” that describes general didactics, or «how to present the subject to make it comprehensible to others» (Shulman, 1986 :9). It can therefore be argued that digital competence is constructed on traditional pedagogy and that digital technology is introduced to enhance the students’ learning experience and facilitate communication and administrative tasks in existing learning environments, mainly on campus. Support units originated concurrently with the need to master the new digital tools that constituted the technological infrastructure in the organizations in the 80 and 90 s. Most informants (n=11) were involved in such support in their organization.

In the second scenario, we also found examples of faculties (n=6) who initially, and on an individual basis, tried to solve challenges related to teaching and learning in their local context. They set out to explore the use of online platforms and can be described as change agents or entrepreneurs with digital agency. *Digital agency* is a broader term grounded on *individual* human choice and ethics/values in the use of new digital technologies in general. Passey et al., (2018) align, for example, *digital confidence* and *digital accountability* with *digital competence* in their attempt at redefining digitalization in education. The scope of the educational activity can generally be understood as «the individual’s ability to control

Table 3 Typology of threshold concepts resulting from the study of pockets of innovation

Mobilization of resources among MOOC-entrepreneurs				
Level of digitalization	Themes	Entrepreneurial practices	Quotes (N=17) from informants	Material resources
Digital competence	<p>Self-initiated digital engagement</p> <p>Entrepreneurs maneuver within established technological infrastructures</p> <ul style="list-style-type: none"> - Entrepreneurs use elements of MOOC design in their courses 	<p>SPOCs</p> <p>Fully Online</p> <p>Courses for registered students</p>	<p><i>The official platform is Canvas, and it cannot be used with course participants, because it is only used for registered students, who opt for ECTS and an exam.</i></p> <p><i>We are not in a position to offer open courses.</i></p>	<p>Learning management system (LMS)</p>
<p>Digital agency</p> <p>Digital transformative agency</p>	<p>Self-organized networked entrepreneurship across institutional silos with ad hoc funding</p> <p>Entrepreneurs maneuver outside established technologies and institutional logics</p> <ul style="list-style-type: none"> - Hands-on experience - Some moral support from leadership at lower levels - Limited time/resources - Variable access to necessary competences - Instructional design work - Technological support - Project management support - Quality enhancement support - Piloting, end-user involvement - Marketing support - Project-based - single-loop entrepreneurship - No or few strategic decisions at leadership and management levels 	<p>MOOCs</p> <p>Micro-credentials for lifelong learners</p>	<p><i>I thought that we must do something.</i></p> <p><i>It has not been easy to reach an audience outside the project and the people who have made use of our support.</i></p> <p><i>When we first contacted you (the support team), we had just received funding for our project, 2,2 million EURO.</i></p> <p><i>We did not understand how different a MOOC is. I think we had no idea about the process and how different the whole learning design is.</i></p> <p><i>We (entrepreneurs) got some part funding, but not much.</i></p> <p><i>Getting things formalized is very complicated</i></p>	<p>Open platform technology (MOOC platforms)</p> <p>Model courses online</p> <p>Hands-on courses on campus</p> <p>Guide-books</p> <p>Websites</p> <p>Animation/video/graphics production</p> <p>technology</p> <p>Refereed publications</p>

Table 3 (continued)

Mobilization of resources among MOOC-entrepreneurs				
Digital transformation	Leadership engagement for institutional strategy development across institutional arrangements. Management engagement for digital policy development at institutional and national levels. Entrepreneurs maneuver between established and emerging technological infrastructures - Institutions establish new technological infrastructure - Double-loop entrepreneurship - Some strategic decisions at management levels - Reorganization of support units involving faculties and staff.	Large critical mass of users on open platforms. Many open and closed courses. Single-standing and stackable courses (study programs)	<i>We have tried, in the reorganization process, to become a center for online learning, but we have not met much understanding for this idea internally.</i> <i>The initiative has now, later been reorganized into a center for learning and education.</i> <i>We have tried to connect the forces that work with teaching and learning, both administratively and pedagogically into something new. And it's probably not finished, I think.</i>	Open Access to education LMS and open platforms as established practice in the organization

and adapt to a digital world» (op. cit. :283). Passey and colleagues further argue that digital agency:

[...] captures (student) teachers' competence in taking initiatives and transforming their practices by selecting and using relevant digital tools. It arises as a necessity when (student) teachers are placed in demanding situations involving challenges or a conflict of motives, thus creating a wish or need to break out of the current situation (Passey et al., 2018 :427).

In Norway, administrative and technologically oriented staff tend to make up support units that support individual digital competence and digital agency development. Hence, they have no research capacity, and often rely on external evaluations (Fossland et al., 2020; Stensaker, 2018). This context also describes the general conditions under which several MOOC entrepreneurs in this study operated.

In this third scenario, the role of *collective* and team-based entrepreneurship is conceptualized as *digital transformative agency* in a bottom-up perspective. Digital transformative agency extends beyond individual digital agency. The concept builds on formative interventions and activity theory (Engeström & Pyörälä, 2021) and is rooted in socio-cultural learning theory (e.g., Wertsch 1985; Bruner, 1990), where knowledge is embedded in and constructed in collective practices in educational, managerial, and entrepreneurial activities. Hence, *teamwork* is a recognized method for innovation, decision making, strategy development and measuring performance, and generally argued to be efficient in HEIs. In our study, some informants received project funding, while others worked on a more ad-hoc or voluntary basis. At management levels, the recognition of results from these pockets of innovation was generally slow in most HEIs. The organization of MOOC entrepreneurial activities through project funding is, for example, often based on principles of transformative agency in education (Langseth et al., 2021). However, human resources, as opposed to technologi-

cal resources, that are developed in teams, are hard to disseminate, since the knowledge that is co-constructed tends to be scarce, specialized, and tacit (Osmundsen et al., 2018; Casper, 2017). Most informants in our study collaborated in complementary teams, involving both staff and faculties over a period of 6–12 months, and where the support unit played an important role. They constituted what we have defined as a pockets of innovation, outside formal institutional arrangements and with limited possibilities of boundary expansion.

In the fourth scenario, the role of organizational entrepreneurship is conceptualized as digital transformation and closely related to management and strategy development. Here, most MOOC entrepreneurs faced serious challenges in their attempt at propelling their results forward. *Digital transformation* is a more overarching concept grounded on *organizational* and *strategic* change to improve business through the adoption of new digital technology (Benavides et al., 2020). The concept originated in the private sector (also referred to as DX) and generally describes a fundamental change, involving the whole organization (KUD, 2007). The focus is on an holistic process to change products and cultures - by focusing on measurable outcomes in the short term and increased effectiveness, value creation and user satisfaction in the long term (Mergel et al., 2019). The transformative aspect in education is, for example, concretized in the SAMR model, where Substitution and Augmentation represent the enhancement of existing institutional digital technologies, and where Modification and Redefinition of educational practice represent digital transformation (Puentedura, 2010). The model, which is often used by researchers to categorize educational practices with digital technology and describe actions and roles taken by faculties and students, has been criticized for a lack of educational context, as well as previous experiences with technology (Blundell et al., 2022). In our study, we found few examples of tangible MOOC entrepreneurial activities in strategy and policy development. An emerging pattern was the reorganization of support in larger support units staffed with complementary competences, also involving research capacity to support a strategy for online learning in the organization. Online courses were then produced to facilitate flexible learning experiences relevant to regular students, the job market, well-being, and society at large. The HEIs varied considerably in the way they prioritized regional, national and international course offerings on open platforms. In line with Osmundsen et al., (2018), we found that MOOC entrepreneurial activities related to digital transformation affect several organizational dimensions, which also entail a redefinition of strategies and the creation of new organizational processes. Also, the result from MOOC entrepreneurial activities is significantly different from the more traditional way of teaching and learning (Berghaus & Back, 2017). Even though MOOC entrepreneurs play a minor role in this development, our findings indicate that this is also work in progress in a managerial attempt at digital transformation.

These key concepts (cf. Table 3) answer our last research question: How can digitalization be described in relation to levels of digital maturity in HE in Norway? The typology justifies the breakdown of digitalization into a great range, diversity and complexity in what constitutes a support unit for digitalization in HE.

5.4 A Model for Digital Maturity

The typology of digitalization may also serve to describe a taxonomy of digital maturity. The concepts involved suggest a functional and more precise language – a set of threshold concepts that once understood, may change the way that people think about the field (Meyer

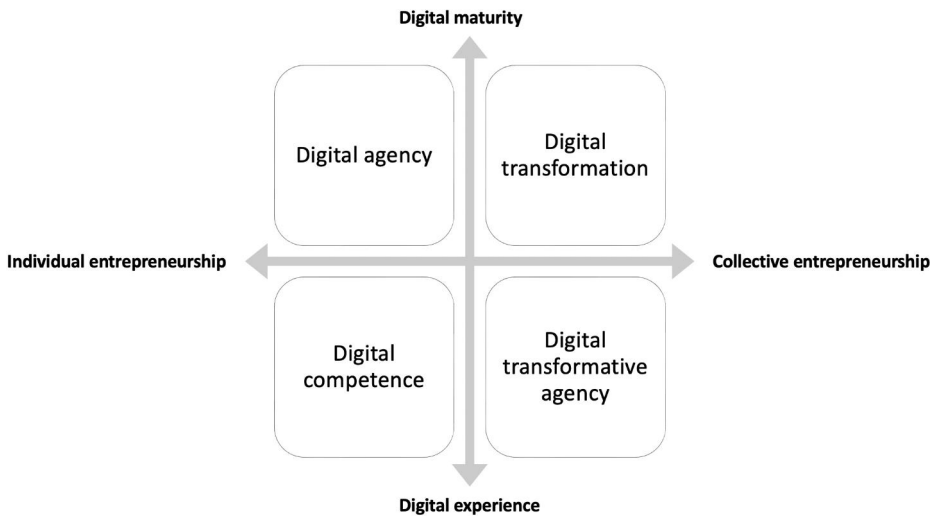


Fig. 4 A model for digital maturity

& Land, 2003) - to successfully inform strategies and challenge existing logics in the organization. Moreover, concept formation, which is particularly fast in the entrepreneurial EdTech field, can support knowledge-building through pattern recognition (Siemens, 2004), such as in Fig. 4 below, where we have visualized our findings in a model for digital maturity that came out of the analysis in this study.

We have based the model on the systematization of well-known and researched concepts for digitalization and contextualized the model in MOOC entrepreneurship in HEI in Norway. The model can also facilitate what Røvik (2016) describes as *translation competence*, meaning a language that transcends institutional logics and serves to inform stakeholders' strategies and policies. Hence, the concepts presented above may bridge the gap between MOOC entrepreneurs and stakeholders at higher levels (cf. Ertsås & Irgens, 2021). Theorizing our analysis in this model, we have painted the landscape of MOOC entrepreneurial mobilization of resources, their room for maneuver and the potential for change in institutional contexts.

6 Conclusion

In this study, we initially asked: How do institutional entrepreneurs at Norwegian universities build capacity for developing fully online courses? and What characterizes the collaborative processes between support staff, faculties and other colleagues during fully online course production? We found that most MOOC entrepreneurs operate outside formal institutional arrangements, where they collaborate across institutional barriers to explore new digital technologies. They seek to establish a pedagogy for online learning and systematic support for faculties. They also aim for organizational change in terms of how digital technologies are perceived and operated in teaching and learning in their organizations. A main finding is that MOOC entrepreneurial activities are still located in pockets of innovation and have not yet been legitimized in formal institutional arrangements in Norwegian HEIs.

We also asked: How can digitalization be described in relation to levels of digital maturity in higher education in Norway? We found that Norwegian HEIs operate at various levels of digital maturity pertaining to different logics in their approach to digitalization in the organizations. We found four scenarios related to change: digital competence, digital agency, digital transformative agency and digital transformation, where the two latter concepts represent collective and organizational change that involve a bottom-up entrepreneurial perspective. Langseth et al., (2018) also describe the bottom-up perspective in digital transformation as a meso-level in HEIs. So far, our findings suggest that the value of MOOC entrepreneurial activities in and in relation to support units has not been fully acknowledged in HEIs.

This is a qualitative study based on interviews with faculties and staff in pockets of innovation. Their entrepreneurial activities were linked to support units, where they collaborated on MOOCs and online course production. Out of these data, we were able to describe entrepreneurial processes in support units in HEIs. Inspired by New Institutional Theory and Social Field Theory, the informants were portrayed as institutional entrepreneurs in loosely coupled systems. Informants typically explained how they established a pocket of innovation, introduced new practices and activities in collaboration with various actors, and ran into interpretive struggles with more powerful stakeholder, thus preventing boundary expansion and maneuverability. Some of our informants were also asking for a national platform for online offerings. The study shows the importance of the bottom-up perspective in digital transformation. In this landscape, support units need to be redesigned.

7 Recommendations

Entrepreneurs play an important role in the development of digital maturity in HEI. Systematic support for entrepreneurial ideas will help faculties and staff develop new educational practices that can move the HEI forward. In this bottom-up scenario, support units will address the problem with loose couplings in the organization. Support units should collaborate with faculties on bottom-up entrepreneurial activities and keep management informed to facilitate the transition of entrepreneurial activities into strategy and policy documents. Hence, a strong support unit can facilitate flexibility in processes related to innovation.

We also recommend that management and leadership pay attention to pockets of innovation and the flow of information from entrepreneurs about recent developments and needs. In this scenario, support units play an important role. For the support to be systematic and transparent, support units should be staffed with technological, multimedia and digital pedagogical competences, as well as research capacity. This also requires a common language that transcends across institutional barriers. Hence, the entrepreneurial results from pockets of innovation can be acknowledged and discussed among important stakeholders and fellow researchers.

We also propose a new model to measure digital maturity, with possible implications for the redefinition of support units. We recommend that the model be used for analysis, planning and change in HEIs. The model may serve to map the landscape of digital maturity in the organization and make it easier to move forward.

8 Limitations

This study has broadened our understanding of the complexity of digital transformation and the forces that govern HEIs. Hopefully, stakeholders and future entrepreneurs can benefit from using the insights from this study in decisions to move digitalization in their organization forward and build strong support units with entrepreneurial power. However, the dominant logics pertaining to existing arrangements in the digitalization of education have been outside the scope of this article, as our focus has been on MOOC entrepreneurial activities.

An obvious limitation in the study is that we did not collect data to explore the phenomena from the management and leadership perspectives. These perspectives were, to a certain degree, intercepted from strategy documents and Institutional Entrepreneurship and indirectly from informants' descriptions of these matters. Nevertheless, management perception of actual processes has not been explored through personal interviews. Such a study remains to be done.

Furthermore, even if we collected data from a strategic sample of MOOC entrepreneurs, the data are limited to a Norwegian higher education context. Thus, we do not know how these phenomena would unfold in other countries with other institutional arrangements. Hopefully other studies will follow up on these issues.

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Declarations

Conflict of Interest We have no conflicting interests to disclose. The research has been carried out within ordinary research time affiliated with our positions at our institutions.

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Authors and Affiliations

Inger Langseth¹ · Dan Yngve Jacobsen² · Halvdan Haugsbakken³

✉ Inger Langseth
Inger.Langseth@ntnu.no

Dan Yngve Jacobsen
Dan.Jacobsen@ntnu.no

Halvdan Haugsbakken
Halvdan.Haugsbakken@hiof.no

¹ Department of Teacher training, Norwegian University of Science and Technology, Trondheim, Norway

² Department of Pedagogy and Lifelong Learning, Norwegian University of Science and Technology, Trondheim, Norway

³ Department of Pedagogy, ICT and Learning, Østfold University College, Halden, Norway