

How Can Interactivity Be Facilitated in a Massive Open Online Course? Lessons from the “Principles of Service Management” Course

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Abstract

Prior research on massive open online courses (MOOCs) suggests interaction to be a key characteristic in terms of improving learners' engagement, skills development, and learning experience. This study investigates learners' experiences of participating in MOOCs in order to develop a more detailed understanding of interaction behaviors and the factors that influence them. Based on in-depth interviews conducted with MOOC participants, the study sheds light on the factors that influence interaction as well as their alignment with the self-determination theory. The results indicate that five *personal* and five *environmental* factors play a role in either enhancing or hindering interaction. Supporting learners' autonomy and personalized learning trajectories should serve to promote both interaction and engagement. Despite the autonomous nature of learning via MOOCs, educators' guidance and encouragement are still required to enliven learners' interactions. In fact, this study also elucidates the social nature of learning.

Keywords:

Higher education, MOOC, interaction, learning experience, learner engagement, business skills, pedagogical development

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1. Introduction

The development of massive open online courses (MOOCs) has changed the field of higher education by rendering it more democratized and accessible (Dillahunt et al., 2014). As MOOCs open the doors and invite everyone to enter the learning space, they enhance the co-creation and co-evolution of learning content among learners with different backgrounds, experiences, skills, and knowledge (Babori et al., 2019). Connectivity is provided through an online platform, which allows for social networking. Furthermore, MOOCs generally have no prerequisites, fees, formal accreditation, or predefined mandatory level of participation (Liyanagunawardena et al., 2013).

Aside from altruistic motives, universities may also launch MOOCs with the aim of increasing their prestige and marketing themselves to potential students, faculty members, financing bodies, and donors (Hew & Cheung, 2014). In the age of lifelong learning, MOOCs deliver their learning content online via a combination of videos, lectures, readings, assignments, quizzes, and discussions, which means that the content is available to virtually every person in the world with no limit on attendance or class size. Yet, from a more critical perspective, MOOCs can be viewed as merely another platform for learning, albeit a more interactive one than, for example, a book. Further, according to Armellini and Padilla Rodriguez (2016), many MOOCs cannot be characterized as pedagogically innovative, even though the potential for innovation exists. However, this is an issue associated with the design of MOOCs (Guàrdia et al., 2013).

The problem of high attrition rates is a common one with regard to MOOCs (Khalil & Ebner, 2014; Sunar et al., 2016) and other online courses (Bawa, 2016; Lee & Choi, 2011). For instance, Jordan's (2014) study of 91 MOOCs found an average completion rate of just 6.5 percent. Previous studies suggest that the attrition rates of MOOCs are lower when learners take part in repeated and frequent interactions so as to exchange ideas, insights, and personal experiences (Breslow et al., 2013; Coetzee et al., 2014; Sunar et al., 2016). Further, peer interaction is known to promote learner engagement (Hew, 2016), foster reflection (Paladino, 2008), and increase learning satisfaction (Lin et al., 2008). However, limited interaction appears to be a persistent and widespread challenge in relation to MOOCs (Hew & Cheung, 2014) and other online courses (Hammond, 1999; Hewitt, 2005; Lee & Martin, 2017; Purarjomandlangrudi et al., 2016). Indeed, the interaction does not seem to occur voluntarily in an online environment (An et al., 2009; Bawa, 2016). Thus, enhancing the likelihood of interaction should be a focal point when developing MOOCs. This raises the challenge of identifying strategies for promoting interaction, something that has been the subject of scant interest in previous research concerning MOOCs (Bozkurt et al., 2017).

Among others, interaction and networking skills are important in the business context (Daellenbach, 2018). Furthermore, reflection (Peltier et al., 2005) and critical-thinking (Roy & Macchiette, 2005) skills represent central aspects of higher education. Educators should thus consider these "soft" skills when planning business education programs, courses, and lectures. Many platforms offering online education stress an approach built on a social learning pedagogy that works on a massive scale. This is also the case in relation to the learning platform investigated in the present study. A social learning pedagogy embraces the idea that interactions between learners, as well as between learners and educators, foster collaborative social learning, which results in all participants learning from each other. Collaborative social learning is one of the major opportunities afforded by MOOCs thanks to their vast scale and diverse range of participants (Davis et al., 2018). Interaction allows learners to see beyond their own perspectives, to challenge their own assumptions, and to obtain a glimpse of a wide range of

challenges and problems that can be encountered in the field of business. Therefore, a focus on interaction is not only significant in terms of improving engagement and satisfaction with MOOCs in general, as it is also a relevant aspect of the development of students' business skills.

Accordingly, the aim of this study is to explore how interaction can be enhanced in MOOCs. Interaction improves learners' engagement, learning experience, and business skills. In the present study, interaction is understood as the interaction that occurs between individuals, that is, through posting messages to ask questions, answer questions, and make comments or suggestions during an asynchronous online discussion. Interaction between learners and the learning content (see, e.g., Abrami et al., 2011; Kanuka, 2011) is not within the scope of this study. Due to the explorative nature of the study, we opt for a qualitative research approach. To achieve our research aims, we examine learners' experiences of "Principles of Service Management," a marketing course offered by Hanken School of Economics, to elucidate the ways in which learners interact (or chose not to interact) with both peers and educators. We also examine why learners participate in interactions as well as what would prompt them to interact more. The study by Guàrdia et al. (2013) identified a need to further develop the pedagogical approaches utilized in MOOCs. This study represents an attempt to do just that.

The remainder of this article is structured as follows. In the theoretical part, prior research on interaction within an online environment is discussed, followed by a discussion of motivation in relation to interaction. Next, the empirical study is introduced, the focal course and platform are described, and the empirical findings are presented. This is followed by a discussion of the results, conclusions, and implications for MOOC design. The article concludes with a discussion of the limitations of the study and suggestions for future research directions.

2. Interaction in online courses and MOOCs

MOOCs can be broadly divided into two different types, namely cMOOCs and xMOOCs (Bozkurt et al., 2017; Daniel, 2012; Guàrdia et al., 2013). cMOOCs are principally based on a connectivist, collaborative pedagogy that focuses on knowledge generation and sharing within loosely organized networks (Kop, 2011; Reeves & Hedberg, 2014), whereas xMOOCs rely on a more traditional approach to learning. More specifically, xMOOCs are based on behavioral, cognitive pedagogy that focuses on knowledge transmission and duplication (Rodriguez, 2012).

Beaven et al. (2014) sought to move away from this binary division by presenting a more nuanced classification of MOOCs in which they can be divided into 1) network-based, 2) task-based, and 3) content-based MOOCs (see also Anders, 2015; Reeves & Hedberg, 2014). The three different types of MOOCs are characterized by different pedagogical ideologies and learning approaches. Of course, MOOCs can simultaneously involve hybrid elements of networking, tasks, and content. The foundation of network-based MOOCs is socially constructed knowledge, which is developed through interactions with other participants during the courses. Task-based MOOCs emphasize skill development through the completion of tasks. Success in terms of completing tasks may rely on networking, although that is not the primary goal. Finally, content-based MOOCs are built around the transmission and acquisition of content. They rely upon automated assessment, and they may also include opportunities for networking and joint learning. However, many content-based MOOCs can be completed without participation in any interaction.

MOOCs can be designed in a variety of ways. It can be argued that design matters in relation to learners' motivation (Salmon et al., 2017) and, ultimately, how they achieve their learning objectives (Hollenbeck et al., 2011). The importance of interaction can also be argued for (Hew,

2016; Sunar et al., 2016). Learning occurs as a result of social practices (Lin et al., 2008). The interaction that is characterized by the exchange of thoughts and reflections among learners results in new ways of viewing things and new ways of acting. Lee and Martin (2017) found that learners emphasize pragmatism during an interaction. Relating content to practice increases learners' willingness to interact and so makes learning more meaningful. Further, according to the same study, reflection and higher-level thinking are also much appreciated by learners in online discussions. Khalil and Ebner's (2014) study of 42 MOOCs examined the reasons why learners dropped out or failed to complete the courses. The reasons identified included a lack of time, a lack of motivation, learners' feelings of isolation, a lack of interactivity, learners' insufficient background and skills, and finally, hidden costs. We can thus state that interaction in MOOCs serves as both a motivator and a method for learning.

The 90–9–1 principle seeks to explain participatory patterns within online communities (van Mierlo, 2014). According to this principle, 90 percent of participants in MOOCs are passive “lurkers,” who do not participate in any interactions; 9 percent are “contributors,” who contribute sparingly; while 1 percent are “superusers,” who are responsible for most of the interactions and discussions. Breslow et al. (2013) report similar numbers. In their study of the edX platform's first MOOC, they found that over 90 percent of learners simply viewed pre-existing discussions, without participating themselves (see also Hammond, 1999; Kop, 2011; Poellhuber et al., 2019). We argue that encouraging lurkers to interact may actively boost their engagement and learning experience.

The kind of interaction that occurs in MOOCs is asynchronous in nature. It is not limited to a classroom, time, or day of the week, which enables flexibility in terms of discussing and debating. Asynchronous interaction also provides learners with time to think and to compose their reflections prior to sharing their thoughts online (Pena-Shaff & Nicholls, 2004). However, Dow (2008) argues for having at least some “live” component during online interactions, as the respondents in her study felt frustrated due to the absence of face-to-face conversation, the absence of visible identifiers of the people they were interacting with, and the lag time between responses.

In the context of MOOCs, an interaction may involve a) learner-to-learner interaction, b) educator-to-learner interaction or c) learner-to-public interaction (see also Abrami et al., 2011; Kanuka, 2011; Moore, 1989). Learner-to-learner interaction involves, for example, responding to other learners' comments or peer-reviewing their assignments. Educator-to-learner interaction (or vice versa, depending on who initiates the interaction) is more purposeful. It may involve learners' questions and educators' answers to those questions. It may also involve educators' general feedback or comments delivered with the aim of encouraging learners. Finally, learner-to-public interaction can be characterized as spontaneous commenting, asking questions, and reflecting with no specific target in mind. This kind of interaction may be responded to, either by other learners or by educators. It is the most common form of interaction in MOOCs (Khalil & Ebner, 2014).

Interaction requires a trust-enhancing environment since interacting with strangers in MOOCs implies some level of vulnerability when compared with interacting in a familiar environment, for example, in a classroom (Hollenbeck et al., 2011). Effective interaction in MOOCs also requires good written communication skills (Lin et al., 2008) and participatory literacy skills (Beaven et al., 2014). Participatory literacy skills refer to learners' ability to contribute to interaction, which means that such skills rely on creativity, reasoning, focus, critical thinking and analysis, and the capacity to network. Learners' mother tongue influences their confidence

levels with regard to expressing themselves in a foreign language (Kop, 2011). Furthermore, it may prove challenging to keep up to date with the ongoing interaction in MOOCs due to the “massive” number of learners enrolled (Liyanagunawardena et al., 2013). However, interaction can also result in fun, entertainment, a social experience, intellectual stimulation, and the possibility to express oneself (Khalil & Ebner, 2014). It helps learners to develop their ideas and construct their own knowledge.

Learner-to-learner interaction facilitates the application of learning of existing knowledge by introducing real-world examples of the subject at hand (Peltier et al., 2005). La Pointe and Gunawarndena’s (2004) study indicates that learner-to-learner interaction has a greater impact on learning outcomes than, for instance, teaching style. Being assigned to smaller discussion groups (Davis et al., 2018; Hollenbeck et al., 2011; Lee & Martin, 2017) and being encouraged to follow specific learners (Khalil & Ebner, 2014) may foster learner-to-learner interaction. A sense of familiarity and a feeling of belonging to a community stimulate both interaction and learning (Cheung et al., 2008). Yet, certain factors may hinder learner-to-learner interaction, including other learners’ lack of commitment to the process and the asynchronous environment that characterizes MOOCs (Salmon et al., 2017). Learners may proceed at their own pace rather than at the recommended study pace, which makes it hard to interact with other learners who are at another stage of the course. Other barriers to interaction include learners’ lack of time and the decision to focus on other course content rather than on the interaction itself (Fung, 2004).

Purarjomandlangrudi et al. (2016, p. 270) state that educator-to-learner interaction “is very important to nurture students’ interest in the course contents and stimulating their motivation of learning.” Educator-to-learner interaction is enhanced by easy access to the educator (Hollenbeck et al., 2011). It also has the greatest influence on learner satisfaction in relation to MOOCs (Khalil & Ebner, 2014). Indeed, timely and substantive educator input gives rise to a greater contribution from learners (Cheung et al., 2008; Wise et al., 2006). However, the degree of educators’ moderation must be carefully considered. Too much intervention may stifle learners’ ability to freely express their thoughts and opinions (An et al., 2009). It is also difficult for educators to interact with a large number of learners. One suggestion for overcoming such issues is to employ trained teaching assistants to help with the task (Hew & Cheung, 2014; Khalil & Ebner, 2014).

3. Interaction and engagement

Learners’ motivation to participate in MOOCs may stem from curiosity, enjoyment, or the desire for professional development and career advancement (Breslow et al., 2013; Salmon et al., 2017). Their motivation could be intrinsic or extrinsic (Deci & Ryan, 1985; Ryan & Deci, 2000), although learners typically exhibit a combination of motivations. Ryan and Deci (2000, p. 54) claim that “intrinsic motivation remains an important construct, reflecting the natural human propensity to learn and assimilate,” as doing so is interesting and enjoyable. However, an extrinsically motivated learner wants to achieve a goal in order to gain an external reward (Salmon et al., 2017). For example, a points system for high-quality learner contributions (Coetzee et al., 2014) or a participation grade for interaction (Lee & Martin, 2017) may be assigned in MOOCs.

Learners’ motivation and engagement are very important in a learning context since they can influence learners’ retention, learning, test scores, and completion rate (Lee & Martin, 2017). The self-determination theory (SDT) of motivation explains learners’ engagement (Deci & Ryan, 1985; Hew, 2016; Ryan & Deci, 2000). The constructs that underpin the theory can be

integrated into social cognitive contexts such as MOOCs (Zhou, 2016). Based on the tenets of SDT, all individuals possess three fundamental psychological needs that move them to act (or otherwise). The three needs are the needs for autonomy, relatedness, and competence. Satisfying these three needs positively influences learners’ engagement (Hew, 2016).

In general, engagement is a multidimensional concept that can be expressed in different ways (Antonaci et al., 2019; Hew, 2016). According to Antonaci et al. (2019, p. 175), engagement can be perceived “as the degree to which the learners are involved in online activities and interact, communicate with others (mediators and peers).” Interaction in MOOCs serves to keep learners engaged, meaning that they dedicate time, energy, thought, and effort to further learning activities (see also Panigrahi et al., 2018). Figure 1 presents the initial framework of learners’ interaction, illustrating the tenets of SDT that influence learners’ engagement. In this study, we are particularly interested in the type of engagement that manifests as active participation in online communication with others using the platform, and thus, the term engagement is here understood to refer to the degree to which learners interact.

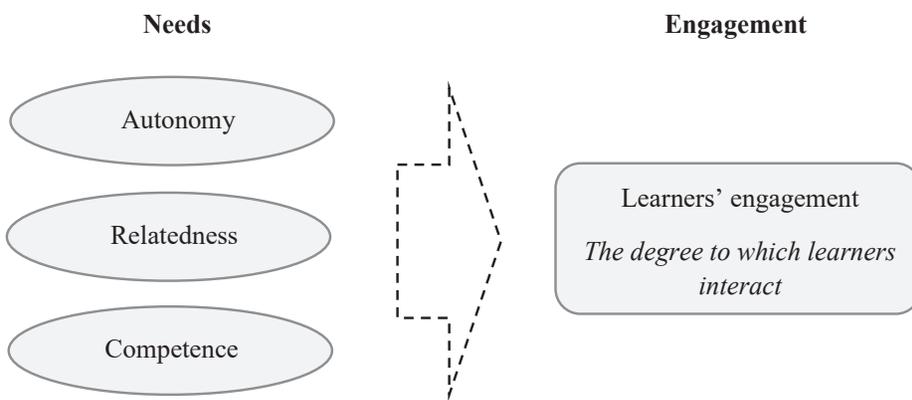


Figure 1: The initial framework of learners’ interaction in MOOCs

Autonomy refers to individuals’ freedom of choice with regard to their actions (Deci & Ryan, 1985). Individuals need to feel free to act voluntarily, which means that they must not feel as if they are being forced to act. Lee and Martin (2017, p. 151) state that “when a student feels controlled by external factors, the level of intrinsic motivation is undermined.” However, in an online environment, learners must be autonomous or self-directed if they are to be capable of learning independently (Bawa, 2016), which may represent a challenge in relation to MOOCs (Kop, 2011). Autonomy does not imply that guidance from, for example, the educators running a course, is not required at all (Hew, 2016). Learners may not know how to proceed with learning a subject. In such situations, learner autonomy is best achieved by educators acting as guides or as resources. Even mandatory assignments and interaction may support learning (An et al., 2009; Cheung et al., 2008). Providing learners with options within a course may also support their need for autonomy (Lee & Martin, 2017). Optional readings, flexible deadlines, learner-selected learning pathways, and proposed alternatives to course assignments are some examples of such choices (Bonk et al., 2018). In the end, achieving success in MOOCs involves striking the right balance between providing guidance and instruction and fostering learners’ sense of autonomy (Beaven et al., 2014).

Relatedness refers to individuals' need to connect with other people, for instance, with their fellow learners and educators (Deci & Ryan, 1985). A sense of relatedness can be influenced, for example, by the degree of familiarity between participating individuals (Cheung et al., 2008; Lee & Martin, 2017). This represents a particular dilemma for MOOCs, as the participating learners are particularly numerous and dispersed. Consequently, educators must determine how to strengthen the feeling of relatedness and familiarity among MOOC participants (Kop, 2011). For instance, where possible, the establishment and facilitation of face-to-face study groups may strengthen learners' sense of relatedness (Chen & Chen, 2015).

Competence refers to individuals' need to master and control their endeavors, for instance, their learning (Deci & Ryan, 1985). According to Hew (2016), competence provides the basis for engagement in, for example, a course, because it is reasonable to assume that a sense of mastery regarding a topic encourages learners to further participate in course activities (see also Cheung et al., 2008). Such a sense of mastery also includes the ability to utilize resources and opportunities within MOOCs as well as to view them critically in order to "appropriate them and redesign them" (Kop, 2011, p. 33), or in other words, to learn from them.

4. Methodology

Reich (2015) argues for the need to reboot the research concerning MOOCs, suggesting that research should move away from the use of large quantitative datasets of a descriptive nature and toward approaches and data that allow for an understanding of, for example, learning. Maxwell (1996) explains that a qualitative approach is particularly suitable when the purpose of a given study is to understand the meaning that informants attribute to events, situations, and actions. Thus, since our aim is to explore learners' experiences, interactions, and views on enhancing interaction, we have chosen to apply a qualitative research approach.

A wide variety of strategies and methods are available for collecting and analyzing empirical data during qualitative research (Coffey & Atkinson, 1996). The use of interviews as a data collection tool is common, and interviews can have different levels of structures (Eriksson & Kovalainen, 2016; Ghauri & Grønhaug, 2010). Qualitative research does not aim to achieve statistical generalization. Therefore, identifying informants to participate in the research is a purposeful process rather than a random one, meaning that the appropriateness of the data and access to informants are central issues (Eriksson & Kovalainen, 2016). The informants chosen for this study were assessed to have rich experiences and insights related to the focal course, which should enable sufficient depth in terms of the analysis and also provide good opportunities to learn about the phenomenon of interest. The chosen informants were all local students, which enabled the interviews to be conducted on a face-to-face basis.

Kuzel (1992) recommends that six to eight interviews be conducted in research studies in which the population of informants is homogenous and the research objective is not to look for disconfirming evidence or to try to maximize variation. Moreover, saturation is typically considered to be a key criterion when determining whether further data collection is necessary in qualitative research (Saunders et al., 2018). In line with these recommendations, we conducted semi-structured, in-depth interviews with eight students from Hanken School of Economics who participated in and completed the "Principles of Service Management" MOOC. The interviews lasted from one to one-and-a-half hours. We ended our sampling when we determined that further interviews would not significantly contribute to new understandings of the concepts of interest. In addition to the interviews, the description of the MOOC was supplemented by course statistics and course feedback, which served as additional data sources.

Demographic data concerning the informants are summarized in Table 1. The main interview themes dealt with the informants' goals and motivations in relation to participating in the focal MOOC, their experience of interaction and their own activity, and finally, the factors that influence their interaction behavior as well as how the interaction might be enhanced in MOOCs (organized around the needs for autonomy, relatedness, and competence, as the initial framework). The interviews were transcribed, and a content analysis was performed to summarize the informants' answers (Tesch, 1990). The utilized coding technique can be described as both theory- and data-driven technique (Saunders et al., 2019). The initial coding was guided by the pre-developed main themes, which were derived from the theoretical framework. More fine-grained sub-categories, which were derived from the interview answers, were created during the subsequent stage of analysis, resulting in an elaboration of the initial framework. The present researchers analyzed the data both individually and jointly, thereby increasing the consistency of the interpretations and enabling the triangulation of the findings.

Table 1: Informants' demographic data

	GENDER	AGE	MAJOR SUBJECT	LEVEL
Informant A	Female	21 years	Marketing	Bachelor, 2 nd year
Informant B	Female	20 years	Marketing	Bachelor, 2 nd year
Informant C	Male	23 years	Marketing	Bachelor, 2 nd year
Informant D	Female	22 years	Marketing	Master, 1 st year
Informant E	Female	21 years	Marketing	Bachelor, 3 rd year
Informant F	Female	22 years	Marketing	Master, 1 st year
Informant G	Male	21 years	Marketing	Bachelor, 3 rd year
Informant H	Male	24 years	Marketing	Bachelor, 3 rd year

4.1 Principles of Service Management MOOC

Hanken School of Economics launched its first marketing-related MOOC, “Principles of Service Management,” in October 2018 on the online social learning platform FutureLearn. FutureLearn is a major European learning platform, with a wide variety of courses available and millions of users worldwide. The course focused on the management of service firms, both traditional service firms and goods manufacturing firms intending to transform their business into a service business. It explored the latest thinking in the field of service management, which covers a service-centric perspective on marketing and management. The course content included topics such as value creation, profitability in customer relations, productivity in the service industry, brand and promise management, and internal marketing. Learners engaged with the subject through short lectures, articles, assignments, discussions, training quizzes, and final tests. All the course material was adapted for use on both mobile devices and computers.

The course was scheduled to run for seven weeks, with an estimated workload of three hours per week. It was open to learners worldwide as well as being part of a marketing course for students of Hanken School of Economics. The course was free to participate in, although a fee (of €64) was charged to learners who wanted to upgrade, which entitled them to, for example, a certificate of achievement. Students of Hanken School of Economics received one credit unit (from a total of four) for the MOOC part of the marketing course, although other learners did not earn any credit units for participating in the MOOC. Instead, a certificate was offered as proof of achievement. The focal MOOC can be characterized as predominantly con-

tent-based, but the format also enabled interaction among a heterogeneous group of learners through possibilities to comment and discuss the presented topics as well as to use other social-media-style interactive functions such as liking inputs from other learners and following other participants' profiles. During the course, interaction was voluntary and did not give, for example, any activity points.

4.2 Social features of the platform

The MOOCs available via FutureLearn are structured into weeks and then into steps within each week. The recommendation is for learners to proceed according to the weeks and the logical orders of the steps, although doing so is not mandatory. Learners are encouraged to engage in discussions and to leave comments, either spontaneously or in answer to a request by educators. Each step has a dedicated discussion forum that is organized as a social-media-like thread, which enables learners to scroll up and down to read the comments (see Figure 2).

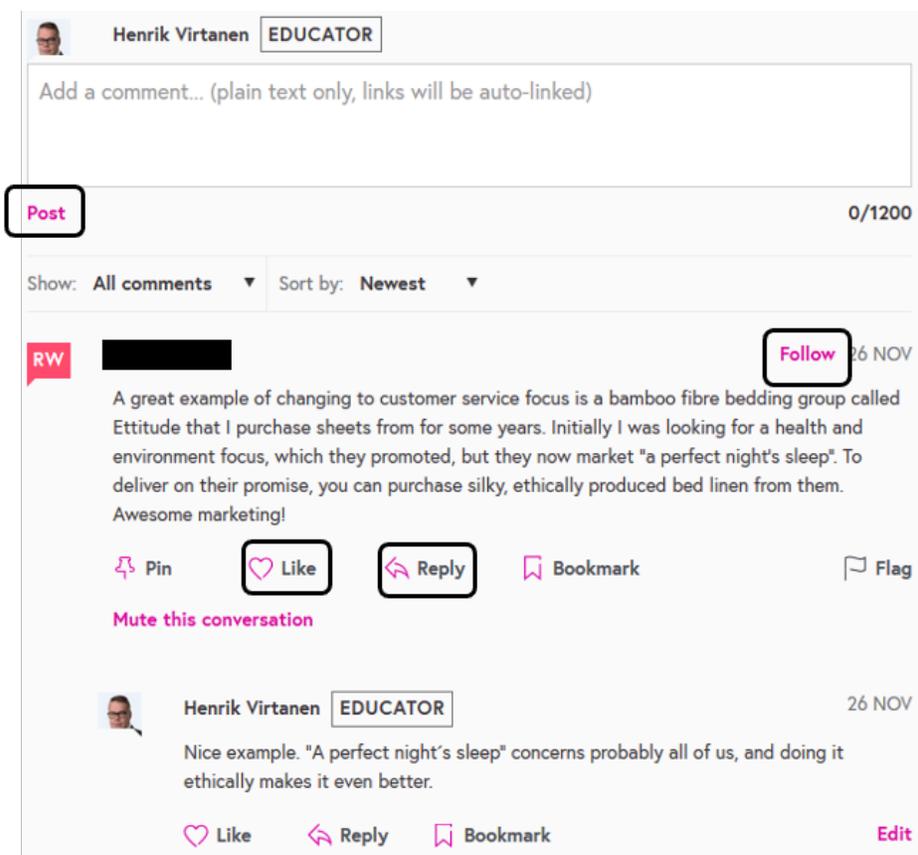


Figure 2: The social features of FutureLearn

Learners can post their own comment and/or like and reply to other participants' (i.e., both learners and educators) posts. Learners are also able to follow other participants. Through the following option, learners can opt to view only those comments posted by participants they follow.

4.3 Statistics and feedback

In total, 1,233 learners from 129 countries *enrolled* in the focal MOOC, of whom 965 *viewed* at least one of the steps (lectures, articles, discussions, etc.) during the first week of the course. The number of learners who *completed* at least one of the steps during the first week was 607. Table 2 presents statistics concerning the course and the progression of activities over the seven weeks.

Table 2: Statistics concerning learners and their activities during the course

WEEK	1	2	3	4	5	6	7	DESCRIPTION
Learners visiting steps	965	355	267	237	201	172	164	Learners who have visited at least one step
Active learners	607	295	239	211	178	154	138	Learners who have completed at least one step
Social learners	270	68	49	32	31	24	21	Learners who have posted at least one comment on any step
Active learners/ social learners	44.48	23.05	20.50	15.17	17.42	15.58	15.22	Ratio (%) of active learners who are also social learners
Visited steps	6,761	3,054	3,116	2,611	2,203	1,915	2,179	Total number of steps visited by learners
Average visited steps per learner	7.01	8.60	11.67	11.02	10.96	11.13	13.29	Averaged against the number of learners visiting
Completed steps	5,312	2,667	2,807	2,369	1,998	1,752	1,967	Total number of steps completed by learners
Average completed steps per learner	8.75	9.04	11.74	11.23	11.22	11.38	14.25	Averaged against the number of active learners
Comments	645	169	110	59	72	42	39	The total number of comments posted by learners on any step
Average comments per learner	2	2	2	1	2	1	1	Averaged against the number of social learners

The above statistics clearly indicate the principal problems associated with MOOCs. The attrition rate for the course was high. The number of learners visiting and completing steps decreased more rapidly at the beginning of the course and then stabilized at the end. The total number of steps visited and completed displayed the same progression. In the end, 80 learners completed the course (upgraded to the certificate), while an additional 82 learners finished more than 90 percent of the course. Given that 965 learners started the course, the completion rate was just 8.3 percent.

The statistics also indicate the need to elaborate further on the strategies that could serve to enhance learners' interaction and discussion. The ratio between the active learners and the social learners decreased from 45.5 percent during the first week to 15.2 percent during the final

week of the course. In light of the statistics, the first week can be seen as exceptional, as the students were encouraged to introduce themselves, which resulted in more comments being left during that week. However, during the later weeks, only roughly 15 percent of learners were contributing to the interaction and discussion, while about 85 percent were passive lurkers. The numbers roughly follow the 90–9–1 principle, despite being slightly higher. The number of comments decreased from 645 in the first week to 39 in the final week, as learners dropped out of the course. The learners seemed to show signs of fatigue, as the average number of comments posted by the social learners decreased from two to one during the course. The drop in the ratio of active learners who were also social learners confirms this assumption.

However, the responses received through the end-of-course survey indicated that the learners were very pleased with the course. Of the 77 learners who took part in the survey, 49 percent reported that the course exceeded their expectations, while 50 percent state that it met their expectations. The majority (97 percent) of respondents were of the opinion that they had gained new knowledge and skills by taking the course, and 66 percent had started to apply their new knowledge and skills after finishing the course.

5. Results and discussion

This section presents an analytical discussion of our empirical findings concerning the factors that either enhance or hinder interactive behavior in MOOCs. We categorize the factors into two types, namely personal and environmental factors (see, e.g., Panigrahi et al., 2018). Personal factors relate to the learner as an individual, and they may influence the learner's interaction behavior. These personal factors are within the control of the learner. Environmental factors relate to the structures and activities within MOOCs, which means that they are beyond the learner's control, although they are more manageable from the course-design and educator perspectives.

The factors that either hinder or facilitate interaction, as derived from the empirical accounts, are discussed in relation to the initial conceptual framework comprising learners' autonomy, relatedness, and competence needs as motivations.

5.1 Personal factors

The interviews particularly highlighted the following personal factors as being influential in terms of interaction in MOOCs:

1. Reward
2. (Online) personality
3. Expectations
4. Social learning
5. Learning from practice

5.1.1 Reward

The learners' discussions regarding the reasons to participate in the interactive aspects of MOOCs largely revolved around the "carrot and stick" concept. The informants considered that some kind of (extrinsic) reward should be provided in return for interaction activity, either in the form of optional activity points (see also Lee & Martin, 2017) or some other type of endorsement.

Bonus points are always bonus points. You can choose whether you want to do the assignment or

not (Informant D).

The informants were generally not in favor of compulsory commenting and discussing. In other words, they did not want learners to be forced to interact in order to receive activity points. However, they did recognize that it could represent an effective means of increasing activity in practice.

To force someone to do something is never fine, although I can see the point of it. If it is not mandatory [to interact], it is possible that no one will participate. It isn't great if some participate but others do not. So, I can understand and see the point of forcing students (Informant C).

As An et al., (2009) state, interaction in an online environment generally appears to not happen voluntarily. Being assigned direct questions and peer-reviews, among other things, were mentioned by the informants as motivating.

It's better to ask directly or to give an assignment instead of waiting for students' spontaneous comments. Then it's easier to contribute (Informant A).

Offering rewards in an attempt to prompt learners to interact is, on the one hand, a means of providing autonomy as well as additional options for participants to learn in the way they desire. For some, it may also relate to the need for competence, as rewards represent an acknowledgment of a learner's input. On the other hand, the informants acknowledged that the realities of autonomy sometimes resulted in students doing the minimum required of them, rather than utilizing the features and learning possibilities that are purely optional. Therefore, the provision of rewards such as bonus points could serve to promote interaction without reducing autonomy.

2.1.2 (Online) personality

Learners have different personalities and exhibit different degrees of introversion and extroversion, which influences their interaction behavior. Learners also have different learning preferences (e.g., learning by reading, listening, discussing, etc.). According to the informants, their interaction behavior in the focal MOOC was, in many cases, roughly equivalent to their interaction behavior during, for example, a classroom discussion.

I prefer to listen to other people and to learn from reading. I didn't participate so much in the discussions, but that's also the case in classroom courses (Informant A).

However, an online context may enhance learners' interaction due to the possibility of being "anonymous." An online context also allows for deeper reflection because, for example, commenting does not have to be as spontaneous as it does in a classroom context (Pena-Shaff & Nicholls, 2004). Yet, the more anonymous online context was perceived by some informants as a "non-community" when compared with a physical classroom filled with friends and acquaintances, which implies a higher threshold for, for instance, proactively initiating a discussion. The informants also reflected on the way they perceived themselves as well as how their competence would come across to other learners:

When you were asked to comment on your main learnings, you were afraid to reveal if you had misunderstood something or to write something that wasn't relevant (Informant G).

Moreover, some informants who regarded themselves as "spectators" rather than as active discussants felt that this was also their role in social media more generally, although they still did not consider themselves to be particularly introverted, as the following quote illustrates.

Now I'm sounding like a really asocial person, but I'm just not very interactive in any online environment, unlike in real life (Informant H).

This indicates that sociality may be reflected in different forms of expressions online than offline.

Thanks to their mass scale and relative anonymity, MOOCs – perhaps even more so than regular classroom settings – enable learners to adopt different social positions among their fellow learners, ranging from active discussants to passive lurkers or independent course accomplishes. For the sake of meeting the need for autonomy, providing learners with the possibility to choose how social they want to be (or which particular discussions they want to participate in) is beneficial.

Personality aspects as well as how a given participant feels about fitting in with the social context of the MOOC can also be related to the need for competence, as manifested in the option to either share one's knowledge or withhold one's viewpoints due to a sense of uncertainty and insecurity. Overcoming this type of issue, together with fostering a sense of relatedness and community among participants in an effort to create an inclusive social atmosphere, constitutes a challenge for MOOC designers and instructors.

2.1.3 Expectations

Learners have different reasons and expectations when enrolling in MOOCs (Breslow et al., 2013; Salmon et al., 2017). Their reasons for participation may, for example, be utilitarian or social. The informants' expectations were more closely related to the subject and the content of the course, while the possibility of enhancing their business-related communication and interaction skills and of strengthening their social presence was less explicitly considered. Thus, the MOOC managed to more clearly address the needs for autonomy and competence than the need for relatedness. Rather than relying on learners' self-direction, a clear statement from educators as to what learners are supposed to do and learn in MOOCs would prove useful and help to fulfill the need for competence.

2.1.4 Social learning

Peer interaction encourages the sharing and construction of knowledge. Following the online interactions was considered to be interesting and fruitful, since fellow learners from different backgrounds and cultures provided reflections, insights, and practical experiences from which the informants felt they learned.

It was more interesting when they [the other learners] came from all over the world. It was enjoyable to read different points of view from students from different places and cultures (Informant B).

The observation of other learners' contributions also confirmed the students' own ideas, thereby linking to the need for competence. In this sense, interaction appears to be a significant learning element not only in terms of an individual's own participation but also in relation to learning from others' interactions (Davis et al., 2018; Lin et al., 2008), particularly if learners perceive that the discussions are at an advanced level.

During the interviews, social learning nevertheless appeared to be a somewhat underutilized opportunity, which was only identified in retrospect. This indicates the importance of also "marketing" a MOOC from the perspective of highlighting the possibilities offered by the heterogeneous social network it draws on.

Social learning improves learners' competence. More specifically, fellow learners' reflections and practical examples from their backgrounds can foster learning and inspire, for example, commenting. Interesting reflections and examples tend to trigger interaction.

It was interesting to read others' comments. They could present viewpoints that you hadn't even reflected upon (Informant E).

In hindsight, one learner pondered on the learning opportunities that the breadth of the MOOC participants offered.

You could make more use of the participants and the work experience they have, almost like mini guest lectures (Informant F).

Thus, MOOCs can provide a setting in which to develop the business-related skills of interaction and networking, thereby answering the need for competence. Reading others' comments and following the discussions also generate a sense of relatedness. Fellow learners become more familiar through interaction, and it represents a starting point for extending the social network. In the case of the informants of the present study, social learning also extended to the offline context, since they studied the online modules or discussed the assignments with local fellow learners outside the MOOC.

We had a group chat with my friends [who also took the course], but not with anyone random (Informant H).

The MOOC functions that enable micro-grouping of this kind could also provide possibilities for similar behavior among participants who lack prior social relationships (see also Chen & Chen, 2015). Addressing participants' need for relatedness can, in other words, be approached from the different levels at which social learning takes place.

2.1.5 Learning from practice

The idea of learning from practice refers to an approach whereby the educator illustrates, for instance, theoretical assumptions and models with practical examples in order to enhance learners' understanding of the course content. Real-world examples and pragmatism in relation to interaction and learning were emphasized in Peltier et al.'s (2005) and Lee and Martin's (2017) studies. The informants in this study believed practical examples to be more memorable and to trigger interaction more easily than theoretical content.

Practical examples inspired more of a discussion. They were easier to assimilate (Informant D).

Linking to practice was good. It was easy to understand and tied it all together (Informant C).

The informants also considered providing or discussing practical cases to be a lower-threshold activity than contributing to conceptual discussions. In such discussions, the activity was sometimes held back by learner insecurity with regard to having correctly understood the terms and concepts. Therefore, particularly in relation to addressing learners' need for competence, practice- or experience-oriented discussion assignments could represent easy first steps toward more interactive MOOC participation.

However, theoretical reflections may also prove inspiring, for instance, commenting on especially controversial and challenging views. The heterogeneity of the participants, considering their geographical spread and varied professional experience, is also something that could be more efficiently and explicitly exploited, both from a social learning perspective and from a learning-from-practice perspective.

5.2 Environmental factors

Further analysis of the qualitative data helped to identify environmental factors that the informants perceived to have the potential to increase their participation in interactions during the MOOC. These factors, which were more extrinsic to the learner, were:

1. Educator activity
2. Community
3. Fellow learner activity
4. Platform design
5. Time issues

5.2.1 Educator activity

The interviews identified the importance of the ways in which educators stimulate interaction, for example, through the types of discussion questions posed (summarizing learning outcomes, detailing personal experiences and examples, requesting solutions to managerial dilemmas, etc.) to help participants feel sufficiently motivated and confident in their capabilities to contribute to group discussions, which is linked to the theoretical notions of autonomy and competence that drive the degree to which learners interact.

You don't know what to say if everything is unfamiliar and new. You must reflect and almost sleep a couple of nights on it (Informant B).

You could ask for subjective views; what one would do in a specific situation (Informant H).

Interaction is facilitated when educators are accessible and visible (Hollenbeck et al., 2011; Khalil & Ebner, 2014). This creates a sense of relatedness. First, all the informants expected that their direct questions would be answered. This can be considered an obligation (hygiene factor). Furthermore, the informants appreciated it when the educators took the time to comment on their general reflections, since it represented an acknowledgment and gave them confirmation that they had correctly understood the content.

From my point of view, if the educator responded to me and thought that my comments were good, it felt like I had said something smart and that I had really succeeded in understanding the topic (Informant A).

This type of guidance also enhances learners' sense of autonomy. The informants in the present study did not expect comments on every general reflection they offered, although they recognized that feedback functioned as a motivational factor in relation to continued interaction. It is also important for educators to address all learners and to occasionally write encouraging posts, for example, to request that learners comment on their fellow students' posts when the interaction activity is declining. The kind of interaction that occurs in MOOCs is asynchronous, although the informants suggested that real-time interaction could prove motivational and also enhance their social presence. Live webcasts and chats with educators or other experts were suggested in the interviews.

It would have been cool if Professor Grönroos [who was the leading lecturer in the MOOC] could also have participated as a moderator in some discussions (Informant E).

5.2.2 Community

Being related to a group or a community influences interaction (Cheung et al., 2008, Lee & Martin, 2017). The members of a given community do not have to be personally acquainted with each other, although their relatedness is built on the fact of them having something in common. In the focal MOOC, the informants felt that relatedness was mostly built on their common (professional) interest in the subject as well as on sharing personal experiences with each other. This may also be the case in other MOOCs. On the FutureLearn platform, it is possible to strengthen the MOOC community by following other learners. The informants in this study were not aware of this function, but after discussing it, they believed that it could repre-

sent a means of getting to know each other and growing their social networks.

It would be relevant. It could increase interaction and offer the possibility to build your own network (Informant C).

You could notice that some people are very knowledgeable (Informant F).

When developing MOOCs in an increasingly interactive direction, a central challenge involves being able to create and foster a sense of community that appeals to participants' need for relatedness. The community must be one that the learner feels eager to connect with. Related to the above-mentioned aspects of fostering social learning and educator activity, the multifarious and varied knowledge and experiences of MOOC participants represent an exceptional basis on which to connect and meet needs that relate to both peers and experts, although their usefulness in relation to learners and their needs could be made more clear and explicit.

5.2.3 Fellow learner activity

MOOCs enable social learning, as discussed above, although the informants in this study did not regard themselves as contributing to the interaction particularly proactively. Rather, they highlighted the usefulness of other learners' comments and the discussions in general. In this sense, social interaction is not only of relevance as a personal factor, since it can be regarded as extrinsic to the learner, depending on who the other learners are as well as how they contribute and interact with one another. It is notable that the MOOC was not delivered in the informants' mother tongues, which Kop (2011) believes may inhibit interaction. This may have contributed to the informants adopting more passive, beneficiary roles.

However, some learners' eagerness to comment, discuss, and ask questions often rubs off on other learners (Salmon et al., 2017). It creates peer pressure, or inspiration, to interact and to be part of a hot topic.

The activity of the other students is important. If nobody is active, you don't see any reason to be active yourself. Participation has a snowball effect (Informant C).

If you can see ten comments in the forum, it inspires you to comment, too. But if you are the only one commenting, you'll stop rather quickly. It creates peer pressure (Informant D).

Active topics respond to the need for relatedness or to feel part of an important conversation with others. As the informants stated that they learned from their fellow learners' reflections and experiences, the absence of interaction negatively affects learning. However, even a passive participant could benefit from others' interactions.

If you saw a professor from another university who was very active, it was smart to follow them. Or a practitioner who had a lot of counterarguments, now that's interesting. The people who made good points, you'd want to follow them (Informant G).

This kind of learning from other, more accomplished participants represents a particular way of fulfilling the need for relatedness.

5.2.4 Platform design

The quote for Informant G in the previous section also highlights how the social media style of platform design may enhance both interaction and networked learning. On the FutureLearn platform, the discussion forums are already organized in the same way as social media threads, and functions such as liking and following are included. Several informants suggested that gamification elements could also be added in order to increase interaction, as previously suggested by Coetzee et al. (2014). For example, publishing a "top scorer" list of contributors or a

“trending discussion” topic could inspire learners to interact more. Endorsements such as likes may also motivate some learners or at least enhance their learning experience through serving as an entertaining extra. Endorsements also foster relatedness in the form of belonging to a specific, active group of course participants.

Another suggestion was to recommend that learners add a photo to their profiles. Currently, doing so is an optional function on FutureLearn. This type of course design detail could also enhance learners’ perceptions of relatedness and familiarity.

5.2.5 Time issues

Prior studies have suggested that a lack of time hinders interaction (Fung, 2004). For students who are more driven by the motivation to achieve fast and efficient course completion, learning through discussion and interaction is less of a priority. Another time-related aspect concerns the asynchronous nature of MOOCs. While flexibility in terms of the pace of study represents an appreciated advantage of MOOCs from a more individual learning perspective, it has a downside from the social pedagogical perspective. The informants in this study found it to be somewhat problematic to interact and to utilize discussions pedagogically when they were all at different stages of the course. For instance, one informant stated that she did not see it as worthwhile to add to a three-week-old discussion or to leave a question hanging when most other learners had moved on from the topic. The third aspect concerning time is the length of the course, as a noticeable decrease in interaction activity was seen toward the end of the focal MOOC. These time-related challenges thus restrict the realization of autonomy and also limit learners’ ability to connect with others. As a result, managing the timing of activities within a MOOC represents a particular challenge for course designers and instructors. Educators could require less open interaction and instead focus on applying course concepts within the online classroom. Setting objectives for the interaction is also a valid option.

Figure 3 summarizes our findings by displaying the personal and environmental factors found to influence learners’ degree of interaction in MOOCs.

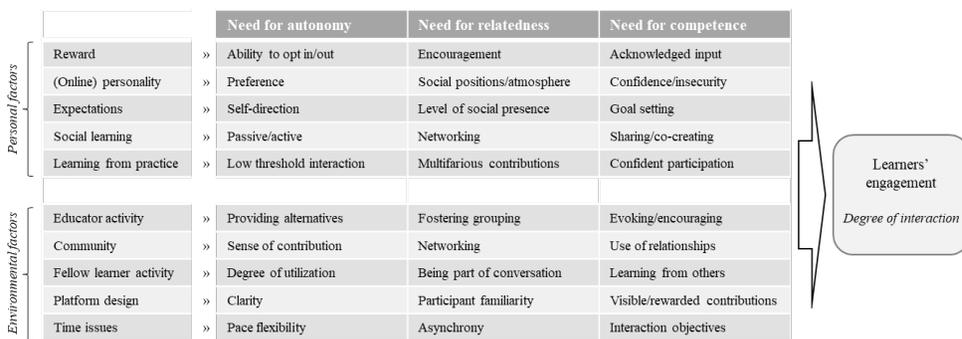


Figure 3: A framework summarizing the factors influencing learners’ interaction in MOOCs

6. Practical implications for MOOC design

This study has identified a number of factors that influence learners’ participation in interactions and discussions within MOOCs. This section provides some suggestions for planners and educators in terms of enhancing interaction among learners in MOOCs. These practical implications have been derived from the findings of the study.

- **Reward:** Interaction in MOOCs could generally rely on a points system for high-quality contributions, thereby providing extrinsic motivation. Another suggestion is to encourage learners to actively endorse (e.g., like) their fellow learners' contributions. Gamification makes it more fun, engaging, and rewarding to contribute to a course, even if not all learners are strongly driven by it.
- **Assigned interaction:** Assigned tasks prompt learners to reflect on the course content and so enhance their learning. Direct questions, blogs, and peer-reviews are examples of assigned tasks that help to increase interaction activity. It is important that the assigned tasks are valued and perceived as interesting and useful by the learners. The assigned tasks may also be personalized, which means that the learners may be given different options to complete their assignments. However, some assigned tasks may need to accommodate the projected pacing of the course. For instance, peer-reviewing requires that the assignment is finished before it can be reviewed and feedback can be provided.
- **Making competence visible:** Educators should pay particular attention to the ways in which learners are prompted to comment, as well as to what types of inputs are invited from them, in order to lower the threshold for taking part, reduce feelings of insecurity, and make students feel they have the knowledge and perspectives to enhance the broader accumulated understanding that is formed through interaction. While discussions concerning theoretical concepts are important, students welcome discussions about, for example, concrete experiences and applied problem solving, that is, questions with less expectations regarding "correct" answers or understanding. This would also serve to enhance the utilization of the international and cross-sectoral experience base formed among participants and so help to make the most of the particular characteristics of MOOCs when compared with other courses.
- **Educator resources:** Educators taking the time to address questions and provide feedback on, for example, learners' comments is appreciated in relation to MOOCs, as it confirms the learners' thoughts and reflections. However, it is impossible for educators to interact with a huge number of learners. One solution is to engage trained teaching assistants to monitor and moderate interactions, provide supplemental tutoring, and offer help via sub-forums dedicated to frequently asked questions.
- **Live webcasts or chats:** The informants in this study mentioned that live webcasts or chats could help to foster a sense of relatedness as well as to enable the emergence of knowledge and understanding through "discussing your way forward" in a manner that is closer to more spontaneous and low-threshold classroom discussions than the written discussion threads typical in the MOOC. During such interactions, learners could participate in discussions led by educators and other expert guests, preferably via all types of electronic devices. Live interactions, however, would pose certain difficulties in relation to accommodating learners from all time zones.
- **To follow:** On the FutureLearn platform, it is possible to follow other learners. This feature enables community building, and learners could be encouraged to actively build their social networks by following their fellow learners. This mechanism could be better communicated to MOOC participants as a learning tool that allows them to utilize the competence of participants with high-quality profiles.
- **Practice-centric social learning:** Their level of knowledge about the subject in question determines whether learners contribute or not to, for example, online discussions. Thus,

learning is promoted when simple-to-understand explanations and shared experiences support it. According to this study, fellow learners' reflections, as based on their practical experiences, trigger interaction, especially if they are controversial. Therefore, this activity should be encouraged. Interaction helps learners to develop their own reflections, express themselves, and establish a social presence.

- **Business skills:** Learners have different reasons for participating in MOOCs. According to the present study, learners may not realize that MOOCs provide the opportunity to develop their interaction and networking skills. One suggestion here is to highlight this aspect of MOOCs to the participants and encourage them to take advantage of the possibility, in addition to focusing on improving knowledge regarding the subject.

7. Contributions, limitations, and future research directions

The aim of this study was to explore how interaction, which is known to improve learners' engagement, learning experience, and acquisition of necessary business skills, can be enhanced in a MOOC setting. Our empirical investigation of learners' experiences of interaction identified factors that facilitate or hinder interaction at both the personal and environmental levels. This study thus advances our understanding of how to transform interaction in MOOCs from being an under-utilized course dimension to being a central element in terms of enhancing the learning experience. In doing so, the study responds to Bozkurt et al.'s (2017) call for more research on the strategies that can enhance interaction in the MOOC context.

This study offers an elaboration of the SDT of motivation, explaining how the three basic needs for autonomy, relatedness, and competence influence learners' engagement. In the present study, engagement is understood as, for example, the degree to which learners interact in MOOCs. SDT has previously been used as a theoretical starting point in MOOC-related research on engagement (Hew, 2016) and acceptance (Zhou, 2016), although to the best of our knowledge, it has not been specifically used in relation to interaction. The theoretical contribution of this study thus lies in this connection, which offers a more nuanced view of what kinds of personal and environmental factors facilitate the enabling or restricting of the realization of the three types of needs in a MOOC setting. The framework presented in this study provides a useful scheme for educators who are interested in enhancing learners' interaction in MOOCs as well as in other online or blended courses. More specifically, suggestions for strategies that educators can use in practice are drawn from the study.

The examination of the "Principles of Service Management" MOOC and the in-depth interviews conducted with eight participants highlighted five types of personal factors and five types of environmental factors that play a role in encouraging or holding students back from interacting in a MOOC context. During the interviews, the informants' interaction activity was discussed at a somewhat general level, and it would be interesting to analyze in more depth the content of their interaction, as well as what triggered it, in order to provide an even more detailed picture of interactivity. This represents a limitation of the study, although, at the same time, it also suggests a possible avenue for future research. Extending the gathered data by focusing on a more detailed examination of the different types of course participants, for example, the particularly active discussants and contributors could help to enrich our conceptual understanding even more. Further research is also invited to confirm and further explore the personal and environmental factors identified in this study as either enhancing or hindering learners' interaction.

Another limitation of this study concerns the fact that the studied population was rather

homogenous. The informants were all Caucasian and they all had a different mother tongue than English, which was the language of the focal MOOC. Thus, the language of interaction, variance in ethnicity, and cultural differences in terms of the propensity to interact were not accounted for in this study. The individual and behavioral traits that influenced the informants' level of interaction, for example, self-expression, self-efficacy, learning preference, attitude, and readiness, were also not in focus during the interviews. Another factor to consider is that the informants completed the focal MOOC as part of a (blended) marketing course at Hanken School of Economics and not as a free-standing MOOC. This may have impacted the informants' answers during the interviews. Despite these limitations, this study contributes to our understanding of how to improve online interaction in MOOCs, which should boost learner engagement and enhance the learning experience.

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