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Hybrid MOOCs Enabling Global Collaboration Between Learners

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The COVID-19 pandemic has accelerated the pace of digital transformation, which has forced people to quickly adapt to working and collaborating online. Learning in digital environments has without a doubt gained increased significance during this rather unique time and, therefore, Massive Open Online Courses (MOOCs) have more potential to attract a wider target audience. This has also brought about more possibilities for global collaboration among learners as learning is not limited to physical spaces.

Despite the wide interest in MOOCs, there is a need for further research on the global collaboration potential they offer. The aim of this paper is to adopt an action research approach to study how a hybrid MOOC design enables learners' global collaboration. During the years 2019–2020 together with an international consortium called Corship (Corporate Edupreneurship) we jointly designed, created and implemented a hybrid model MOOC, called the "Co-innovation Journey for Startups and Corporates". It was targeted towards startup entrepreneurs, corporate representatives and higher education students and it was funded by the EU.

The MOOC started with 2,438 enrolled learners and the completion rate for the first four weeks was 29.7%. Out of these 208 learners enrolled for the last two weeks, which in turn had a completion rate of 58%. These figures were clearly above the general average for MOOCs.

According to our findings, we argue that a hybrid MOOC design may foster global collaboration within a learning community even beyond the course boundaries. The course included four weeks of independent learning, an xMOOC part, and two weeks of collaborative learning, a cMOOC part. The xMOOC part supported learners in creating a shared knowledge base, which enhanced the collaborative learning when entering the cMOOC part of the course.

1 Introduction

For better or for worse, the outbreak of COVID-19 pandemic has initiated a sudden transformation of the long-predicted trends related to work and study online [4]. As a result, people have had to adapt quickly to collaborating online. On the bright side, global collaboration is no longer limited to merely physical spaces, but the question remains to what extent may all aspects of a successful collaboration be achieved by purely online means. Furthermore, this new era has increased the need for online learning opportunities as many learners are seeking to develop their competences. MOOCs are open online courses offered free-of-charge to anyone from anywhere in the world [7]. Given the easy access, they have potential to attract a wide target audience, especially during this new era.

The two main types of MOOCs are called xMOOCs and cMOOCs and their pedagogical designs are very different from one another. The first generation of MOOCs, cMOOCs, are based on connectivist theory and are focused on social learning [10], where learners' creativity, autonomy, and networking are encouraged, and learners are expected to enrich the course's content [17] by using different digital platforms and technology. The second generation of MOOCs, xMOOCs have a behaviorist approach, i.e. they are focused on knowledge duplication, where students are required to master what they are taught [17] and the majority of content is created and presented by instructors only [16]. xMOOCs, are designed to be scalable, standardized and they promote centralized knowledge production, where communication is mainly one-sided. Due to the nature of xMOOCs, they are not suited to foster collaboration on their own. Therefore, we assume that a hybrid model combining elements from both xMOOCs and cMOOCs is better suited to enhance collaboration.

The concept of hybrid MOOCs may be understood in various ways according to prior research. It may be used to describe a "learning initiative, strategy or model that integrates MOOCs and MOOC-related technologies into a traditional curriculum" ([15]. In this paper, however, referring to [8, 11] we define hybrid MOOCs as purely online MOOCs, which combine elements from both xMOOC and cMOOC models.

During the years 2019–2020 we jointly designed, created and implemented a hybrid model MOOC, "Co-innovation Journey for Startups and Corporates", with an international consortium, called Corship (Corporate Edupreneurship), consisting of higher education institutions, corporate and startup associations across several European countries. The course was focused on entrepreneurship and, more specifically, on startup-corporate collaboration.

Referring to the need to increase understanding of how to enhance collaboration among global learners and how a hybrid model MOOC may respond to that need,

we have investigated the above-mentioned MOOC from these perspectives. Thus, the research question of this paper is: How does a hybrid MOOC design enable learners' global collaboration?

2 Learning Communities in MOOCs

Prior research has widely recognized that one of the most negative aspects of MOOCs is that they suffer from rather low completion rates [7, 1]. According to various studies [2, 12], the average completion rate is less than 10%, which emphasizes the difficulty for MOOCs to keep learners engaged and active. According to [5] one of main factors affecting course quality and completion rates is the lack of interaction between instructors and learners. Due to the limited possibilities for this interaction when teaching masses, peer support plays an essential role in the learning [14]. Therefore, it may be worthwhile to invest efforts in building a community among learners, which may support learners to be more engaged, respect each other and achieve better performance [19] and help build confidence and stimulate active participation [13].

West and Williams [18] suggest that no one definition of learning community exists but they can be described from the participants' point of view. They argue that, in order for participants to form a learning community, they need to sense they have access with one another, a relationship with other learners (sense of belonging, interdependence, trust and faith in the purpose of the community), a shared vision or shared practices. Furthermore, a learning community should be a place where people feel comfortable, trusted, and valued [14]. Therefore, a learning community helps to enhance collaboration. Prior research demonstrates that learning communities built in MOOCs may even continue to grow independently after and beyond MOOC boundaries via social media and networks [10].

3 Methodology

This research addresses how a hybrid MOOC enables global collaboration. Our focus is on the learners' actions and the emerging learning community within the MOOC in question. Therefore, action research is an appropriate approach since it is suitable for research settings, which describe or unfold a series of actions taking place over a period of time in a community or group [9]. Furthermore, characteristic features for action research include the participation of the researchers, interaction and involvement as well as proximity to the research object [9, 6]. We planned and designed the MOOC iteratively as a collaborative effort among seven European

partner organizations[3] representing viewpoints from startups, corporations and higher education. The researchers of this paper were responsible for the design and implementation of the cMOOC part, and contributed to the design of the xMOOC part. They had access to all other materials and were closely involved in the whole process and therefore, they were able to observe the entire process: planning, implementation and further evaluation.

Figure 1 highlights the action points of this research and the data that was collected and analyzed during each of the action points.

PRE-MOOC	DURING MOOC	POST-MOOC
Planning and creation stage	Implementation stage	Evaluation stage

12 months before MOOC **Action point:** Interviews (14) with practitioners related to the topic of the MOOC **Type of data:** MOOC Reports	**Action point:** Observations on participants' discussions **Type of data:** Discussion forum comments	**Action point (On-going):** Participation and observations in the Learning Community (LinkedIn group of active 249 learners) Frequency of posts: > 3 posts per week **Type of data:** Posts and comments in the LinkedIn group
0-12 months before MOOC **Action point:** The co-creation of the MOOC with the consortium, meetings on a monthly basis to coordinate the xMOOC and cMOOC parts **Type of data:** Meeting notes	**Action point:** Questionnaire to participants (after four weeks) **Type of data:** survey results	
	Action point: Participants'reflections during the cMOOC part (last 2 weeks) **Type of data:** Reflection notes from learners' learning diaries	

Figure 1: Action points of the research and data collection

The data was collected and analyzed during the following stages: pre-MOOC (planning), MOOC (implementation) and post-MOOC (further evaluation) periods. The timeframe for the planning of the MOOC was around 12 months before it was launched in April 2020. Before the planning started, the members of the consortium wrote research reports to lay a foundation for the contents. During the planning stage, the MOOC was designed in iterative cycles involving practitioner feedback and constant mutual feedback among members of different working groups. Each partner organization was responsible for a certain week, however the whole consortium planned and co-created the contents together. This process was carefully documented.

The implementation of the MOOC automatically created a large quantity of data through the participation. Typically, action research focuses on what practitioners do rather than what they say they do [3]. In addition, the participants were

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involved in voluminous discussions in the forums of the MOOC platform and participant reflections were also collected. The participants in the MOOC – like the creators of the MOOC – represented startups, corporates and higher education institutions. After the MOOC ended, the learning community was maintained through a LinkedIn group.

Action research is based on practical problem solving and systemizing that experience to research [9]. The analysis is based on the systematic categorization of the building blocks related to both parts, xMOOC and cMOOC. The results are indicated in the findings (see Table 1: Hybrid MOOC design "Co-Innovation Journey for Startups and Corporates").

4 Results

In Table 1, we present the design of the hybrid model MOOC, "Co-innovation Journey for Startups and Corporates". Learners who completed the first four weeks, were able to register separately for the last two weeks of the course. During the first four weeks learners created a shared knowledge base, which enhanced the collaborative learning in a team task during the last two weeks.

The MOOC was free and open for anyone to take, but was targeted towards startup entrepreneurs, corporate representatives and higher education students. Next a brief overview of the learners that took part in the MOOC will be presented.

4.1 Description of Learners

In Figure 2, we present the number of learners during the different stages of the MOOC. Learners had the option of completing only the xMOOC part of the course or continue to also complete the cMOOC part. Those learners, who wished to complete both parts of the MOOC, had to register separately for each part. The cMOOC part of the course was only available to the learners, who completed the xMOOC part.

As shown in Figure 2, a total of 2,438 learners enrolled for the xMOOC part of the course, i.e. the first four weeks. Out of those 1,609 (66%) started the course by being active on the platform, the rest of them remained inactive and did not complete any of the tasks. A total of 728 learners completed all the tasks during the first four weeks, the xMOOC part, which is around 30% of the 2,438 enrolled learners.

Out of the 728 learners, who completed the xMOOC part of the MOOC, a total of 208 learners enrolled for the cMOOC part of the MOOC, which consisted of a team task and self-reflections. These learners were divided into 41 teams, each consisting

Table 1: Hybrid MOOC design "Co-Innovation journey for startups and corporates"

|	XMOOC PART DESIGN (WEEKS 1–4)	CMOOC PART DESIGN (WEEKS 5–6)
Main focus	Scalability	Community and connection
Learning focus	Theory and concepts	Experience, application and reflections
Participants	Open for all, main focus group: higher education students, corporate representatives and startup entrepreneurs	Learners who completed the first four weeks of the MOOC
Type of learning	Individual learning	Collaborative learning in teams
Workload	~6h/week (25–30h) = 1 ECTS	~15h (25–30h) = 1 ECTS
Communication	Limited, mainly discussion forum for questions/feedback	Open discussion in a team's own collaboration space (Collab Space), group work outside the MOOC platform (Jitzi, WhatsApp, LinkedIn, Zoom), and discussion forum for questions and feedback
Main learning outcome	Understanding theories and tools related to startup-corporate collaboration	Apply the theory and tools in teamwork
Contents	High-quality video material, articles and other reading materials, short quizzes, final exam	Some high-quality video material, startup-corporate collaboration cases, Co-Innovation Builder
Assessment	Automatic grading	Peer assessment
Role of teacher	Content creator, expert and moderator	Facilitator from outside the teamwork Moderator with strong focus on technological problem solving during the course
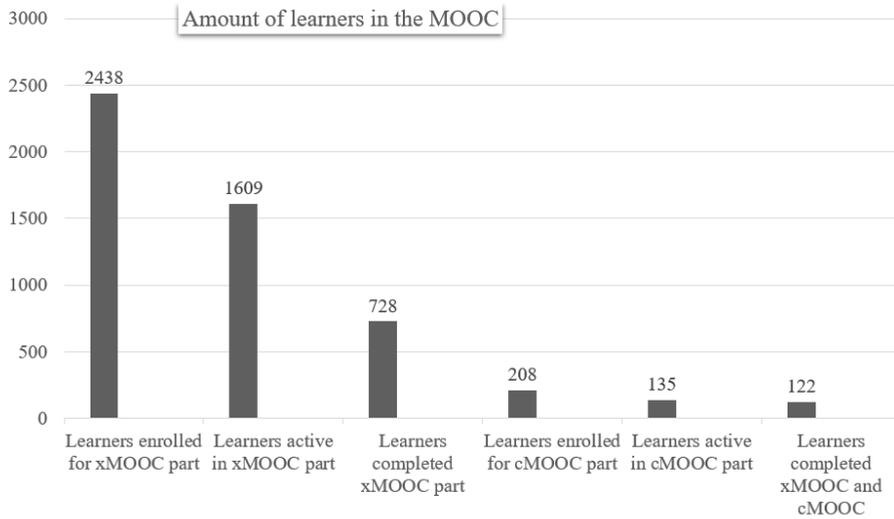
Figure 2: Number of learners in the different stages of the MOOC

of 4–5 learners. Because the drop-out rates in MOOCs have been typically rather high as stated in prior research [7, 1], we assumed that some of the team members would drop out at some stage of the team task. Taking that into consideration, we decided to build teams of at least 4 people. Out of the 208 enrolled learners for the cMOOC part, a total of 135 learners were active, contributed to the team work and submitted their final work in the platform. By the end of the MOOC, 122 out of those 135 learners received a passing grade for the full course (xMOOC + cMOOC), which constituted 58% of the learners enrolled for both parts of the course (N = 208). Only two of the teams did not submit anything and stayed inactive until the end of the course.

The average age of learners that took actively part in both the xMOOC and cMOOC parts of the course (N = 135), was 37, ranging from 21 to 60. A total of 88 (65%) were male and 46 (34%) were female. The majority of learners were in employed and had professional backgrounds in business either working in a startup or a corporate. Only 3 of them were merely higher education students and were not currently working. As learners shared similar goals and an interest in startup-corporate collaboration, they were motivated to learn and network with one another. Furthermore, the vast majority of them, 130 (96%), stated that they had prior experience of working remotely alone and as part of a team. A few of the learners mentioned that due to Covid-19 they had had to learn how to work

remotely both independently and in teams, because they did not have experience from before.

The nationality of learners that took actively part in both the xMOOC and cMOOC parts of the course (N = 135), are shown in Figure 3. The majority of learners were from Germany (51), Austria (14) and India (10).
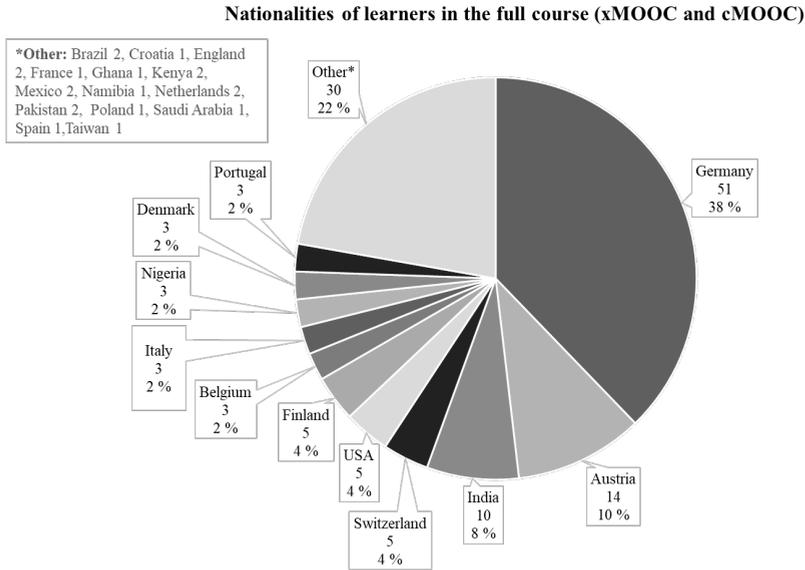
Nationalities of learners in the full course (xMOOC and cMOOC)

*Other: Brazil 2, Croatia 1, England 2, France 1, Ghana 1, Kenya 2, Mexico 2, Namibia 1, Netherlands 2, Pakistan 2, Poland 1, Saudi Arabia 1, Spain 1, Taiwan 1

Figure 3: Nationalities of active learners in the full course (xMOOC + cMOOC)

As Figure 3 presents, the hybrid MOOC attracted learners across the globe. The MOOC was built in the mooc.house platform, which is German. We believe that played a key role in attracting so many German learners as the MOOC was marketed to other existing MOOC course participants via the platform. The consortium consisted of members from the EU (Austria, Belgium, Finland, Germany, Poland and Portugal), which also explains why so many learners were from these countries and from the EU region as marketing of the course was done mainly to existing audiences of each institution.

4.2 xMOOC – Independent Study Phase

The xMOOC part of the course was focused on knowledge acquisition about startup-corporate collaboration. Learners studied theories, were introduced to collaboration tools and acquired practical knowledge of startup-corporate collaboration. They had access to high-quality videos and articles, and there were opportunities to share ideas and opinions with one another in different discussion forums on the course platform. Learners took short quizzes to test their knowledge of the subject matter, and at the end of the four weeks, learners took a final exam, which was compulsory to take in order to receive a grade.

Due to the large number of participants in the xMOOC part, we as educators needed to preplan and create a standardized and automated, scalable learning design. Furthermore, we moderated discussion forums to remove learning barriers, for example, by answering questions and encouraging learners to share ideas about the topics. The xMOOC part was essential for learners to create a shared knowledge base before entering the cMOOC part of the course. This was evident in the learners' reflections:

"Yes, as a team we were able to identify any issues that were discussed in earlier weeks (1–4) because we kept going back to some of the materials to read again or re-confirm what we had learned." (MOOC participant's reflection note)

"It was so great the preparation, all the team working together in the assignment, allow us to know the best skills of each one. Yes, here was where we review the most the content for 1–4 weeks and the group debates allow us to integrate the concepts more." (MOOC participant's reflection note)

4.3 cMOOC – Collaborative Learning Phase

The overall objective of the cMOOC part of the course was to deepen learners' understanding about co-innovation between startups and corporates by encouraging them to collaborate in a simulated startup-corporate collaboration case. Because most of the learners had prior work experience working in startups or corporates, the niche study theme on co-innovation between startups and corporates motivated learners to participate in the cMOOC part. Learners were asked to register separately for the team task (the cMOOC part) after completing the first four weeks of the course (the xMOOC part) and teams of 4–6 persons were formed on the basis of the following:

- their time commitment for the team task (1–2h, 3–4h or 5–6h/week)

- time zone of the participants

- the role they wished to take (startup/corporate): each team had to have both roles represented and each member could choose their own role

- having at least one person who wanted to lead the team included in each team

- gender: having both female and male participants in each team

Furthermore, five teams were formed on the basis of having the lowest performance in the xMOOC part, because it was suspected that they would drop-out. The teams were formed with a Team Builder tool that helped form versatile teams with the chosen parametrics.

The cMOOC part included real-life startup-corporate collaboration cases, weekly task instructions, a set of collaboration tools and self-reflection tasks. The final outcomes made by the teams were assessed by other teams and all teams assessed the performance of their own members.

We paid strong attention to clarity when creating the course contents and instructions, as well as, with our communication with the learners. Due to the large number of learners, we saw that modifying them later during the course could have caused a lot of difficulties and confusion. Furthermore, together with the consortium we created a digital tool, called the "Co-Innovation Builder", to support teamwork. The tool was seen as essential, especially, since the educators had limited possibilities to support the teams. It also helped teams to create strategies and solutions for the team task. This was strongly evident in the majority of learners' reflections:

"Co-Innovation Builder is a great tool to collaborate and share our views with different perspective yet keeping us focused on what we need to put in our agenda while discussing." (MOOC participant's reflection note)

The MOOC learning environment required learners to take responsibility for initiating, organizing and managing team work autonomously. In most teams, learners collaborated actively by giving feedback, clarified misunderstandings, shared experiences and made decisions together. Furthermore, according to the learners' reflections they recognized the benefits of collaborative learning over individual learning.

"Working as a team definitely was an added advantage in identifying issues that were discussed in earlier weeks (1–4), and recognizing and challenging the gaps in our knowledge while helping the team to fill them [collaborative tool, Co-Innovation Builder, elements] was a plus that cannot be replaced if doing the work individually." (MOOC participant's reflection note)

Team members' diverse cultural backgrounds, experiences, perspectives and prior knowledge were used as 'raw material' in social knowledge construction.

"What I considered really interesting is the fact that each of the team members have a different background, no-one is coming from the same industry." (MOOC participant's reflection note)

At times the diverse backgrounds also posed challenges according to learners' reflections:

"We had some communication issues due to the language and culture (e.g. Greeks say 'ne ne ne' but it means 'yes')."(MOOC participant's reflection note)

The broader knowledge base allowed each member to benefit from collaboration by constructing individual knowledge and developing cognitive (thinking, problem solving and decision making) and affective (feelings) aspects of learning. Having the same interest with peers, a sense of community, willingness to share and mutual trust were key elements in building a learning community, which was evident in a survey conducted after the first four weeks of the course. We received responses from 148 learners. They were asked the reasons for why they shared experiences and thoughts with peers. They had an option to choose a maximum of 3 reasons, and the majority of them answered as follows:

- same interest as peers (N = 91)

- sense of community (N = 86)

- pure willingness to share (N = 78)

- mutual trust (N = 42)

Some learners even took a step toward a sustainable learning community, when they created a LinkedIn group for course members during the course. The LinkedIn community is still sustained and active today. It was evident from the learner's comments that they wish to sustain the networks:

"I have connected with some participants from different parts of the world and hope to keep this professional network going and support each other's initiatives; have also learned about some resources that will help along the journey, and, partnerships around common work that I'd like to pursue." (MOOC participant's discussion forum comment)

We argue that a hybrid MOOC design may foster global collaboration within a learning community even beyond the course boundaries. As one of the MOOC focus group participants called it "by connecting the different minds from all over the world".

Some weak points were detected in the hybrid model. Building the MOOC together with an international consortium took a lot of time and resources, because there were many people involved in the process. The cMOOC part required a rather extensive amount of time for solving problems, communicating clearly, answering to discussion forums and sending constant reminders. The xMOOC part required more time in the content creation, but the implementation was mainly

automated. The MOOC also required us as educators to take a different role than in a traditional classroom setting shifting the responsibility for learning to learners to a greater extent. The interaction between learners and educators was rather limited due to the large number of learners. Therefore, educators were not able to support learners, who needed more guidance as strongly as in a classroom setting.

5 Discussion and Conclusion

Overall, these results indicate that the majority of global learners, who completed the hybrid model MOOC, were committed to collaborating and had an active role in knowledge construction with the most recent knowledge from the field. Moreover, the learners contributed to further development of startup-corporate collaboration. Our results are in line with prior research, which has indicated that building a learning community supports collaborative learning [19] and that a learning community may continue to grow independently after the MOOC, for example, via social media [10]. It was surprising for us that the learners took an active role in building a learning community beyond course boundaries and saw the MOOC being merely the starting point for bringing together people enthusiastic about co-innovation between startups and corporates. One year after the course, it is evident that the movement triggered by the MOOC appears to be steady. We argue that the MOOC had novelty value in starting this movement.

Furthermore, the completion rates were above the general average (less than 10%) for MOOCs [2, 12]. There are several possible explanations for this unexpectedly high completion rate, such as, the background of learners or timing of the course. However, we argue that the hybrid model may have had the strongest impact. Most of the inactive learners dropped out during the independent xMOOC part, and, thus, they did not compromise the completion of the cMOOC part for the more active learners. We argue that a hybrid model MOOC design with first a xMOOC part and then a cMOOC part to be the decisive factor for this. Moreover, the results show that the design of the hybrid MOOC enhanced the collaborative learning. Mainly because it supported learners to first create a shared knowledge base, which was fundamental for the collaboration.

Our results revealed the importance of building a learning community for collaborative learning and how creating a shared knowledge base was an essential first element for doing so. The results also demonstrate that communication technologies, such as social networks, allow new global collaboration possibilities beyond the facilitated learning that should be further researched. The results also highlight the potential disadvantages of a hybrid MOOC. It is not easily scalable due to the cMOOC part, which requires educators to be active during the implementation.

In addition, creating a hybrid MOOC, especially with a consortium consisting of many people, required a lot of time and resources to build it. It also required learners to take more responsibility for their own learning.

Because our research was focused on one MOOC and a rather focused group of learners, the findings may not be generalized as such to all MOOCs. Therefore, we purpose that further research should be undertaken in collaborative learning and building learning communities in hybrid model MOOCs. The practical implications of this research contribute to the need in sharing best practices of how to enhance collaborative learning in MOOCs and building learning communities.

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