



Teaching Creativity at Scale: Overcoming Language Barriers in a MOOC

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Massive Open Online Courses (MOOCs) allow higher education institutions to deliver courses for free to anyone with Internet access and thus to attract expansive linguistically diverse audiences worldwide. The purpose of this article is to address language barriers and challenges for creating and maintaining online learning communities in the Creativity, Innovation and Change (CIC) MOOC. This exploratory and descriptive study relied on CIC MOOC data and learning analytics framework to guide the analysis. The article discusses a number of strategies for fostering community as well as course innovations to make CIC more attractive and engaging. Authors conclude that understanding how to promote community with linguistically diverse students when aiming to teach creativity at scale contributes to a better comprehension of and responding to the needs and challenges of non-native speakers in the MOOC platforms.



Introduction

There is a global demand for creativity and formal education as offered by public and private education providers is often called upon to meet that demand (Craft, 2005). Massive Open Online Courses (MOOCs) allow higher education institutions to deliver courses for free to anyone with Internet access and thus to attract expansive audiences worldwide. Due to the global capability of the MOOC platforms, enrolled learners come from a variety of linguistic backgrounds. While this allows diverse students to collaborate, it also causes barriers that have the potential to hinder course community, i.e. students' opportunities to engage with one another within the course are limited. In the broadband world of education, learners are in demand of conversations and not only lectures (Barber, 2013). One barrier is that many students in a MOOC speak a different language than the primary language of instruction of the course. To make situation more complex, language barriers are more prone to interfere with learning and course experience when the course content, such as creativity and innovation, is interdisciplinary in nature. To this end, the challenges for teaching creativity at scale in the MOOC platforms are two fold: first, designing the course and online learning experiences so that they are effective and appeal to a large number of students in a non-conventional setting, and second, including students with diversity of languages and language skills when there is no prior filter as to who can enroll for a MOOC.

Teaching creativity, innovation, and change online and language barriers were obstacles in one MOOC that ran in 2013 and 2014 in the cohort-based mode, and is now offered by demand since 2015. A large proportion of learners that signed up for the course did not speak English as their native language, so the MOOC creators used strategies in the second iteration of the course to improve the course design for teaching creativity at scale and to overcome the language barriers that threatened community engagement. These strategies and course design innovations included:

1. Streamlining the course along four key ideas, namely creative diversity, CENTER, innovation, and value creation
2. Shortened the course from eight to six weeks
3. Introduced peer assessment (all submissions were required in English only)
4. Hiring translators to translate the course into a second language (Mandarin Chinese)
5. Actively promoting peer review and discussion forum posts
6. Using volunteer community teaching assistants (CTAs) and staff from culturally



diverse backgrounds to encourage student collaboration.

The purpose of this article is twofold: first, to describe and reflect upon the process of developing, teaching, and revising a MOOC on creativity, innovation and change, and second, to describe preliminary findings of the team's effort to foster community in the fully online learning environment. The article explains the six design choices used upon the revision of the MOOC for the second offering so that others who consider creating a MOOC on creativity and innovation may gain insights from them. The goal of the article is to provide an answer to the following question: How and which course innovations seemed to promote student engagement and community among non-native speakers in a primarily English MOOC? This article explains how the CIC team perceived the effectiveness of the six design choices. As the team monitored feedback from the course members, it made adjustments to enhance student experience while the course was underway. Therefore, the article is a descriptive explanation of the happenings within the MOOC with limited qualitative and quantitative data inserted when the team used data to enhance strategies.

Conceptual Framework and Relevant Literature

In line with one of the core ideas taught in the CIC MOOC, the team relied on Intelligent Fast Failure (IFF) principles to revise the CIC MOOC delivered in 2013 and update it for the second offering in 2014. IFF has been developed during the 1990s (Matson, 1991, 1992, 1996) and also further elaborated on more recently (Tahirsylaj, 2012). Unfolding the three key words in IFF, Matson (1992) noted that *Intelligent* means that when taking risks one needs to focus on learning about what is working and what is not working while collecting as much feedback; *Fast* means acceleration of the risks so that what works is identified as soon as possible; and *Failure* means that most plans and actions will actually fail, however, it is through failure that required knowledge to succeed is acquired. The IFF principles were appropriate to apply considering that the MOOC environment overall was at an initial stage of development during 2013 and 2014. The MOOC providers themselves were applying IFF in efforts to develop platforms that maximize learning and effectiveness of course offerings. For example, Coursera, one of the largest MOOC platforms to date, moved from cohort-based model, when courses ran within a certain period of time, to an on-demand or self-paced model, when MOOC courses are always open, within its first few years



of operation. The team also followed the Amiel and Reeves (2008) understanding that a design-based strategy was most appropriate for improving the course. Reeves (2006, p. 58) highlights three principles of design-based research framework:

... addressing complex problems in real contexts in collaboration with practitioners; integrating known and hypothetical design principles with technological advances to render plausible solutions to these complex problems; and conducting rigorous and reflective inquiry to test and refine innovative learning environments as well as to define new design principles.

Instead of relying on top-down research, the team improved content by analyzing practical problems, developing and trying solutions, reflecting and reporting results. The CIC team employed IFF principles and design-based approach throughout all the stages of initial course development and follow-up course revisions, in particular for addressing the challenges faced with discussion forum engagements and fostering learning communities.

Clinnin (2014) found in her study that discussion forum interactions and the formation of multilingual learning communities helped students meet their learning objectives. This understanding is nuanced with findings of O'Dowd (2003) who shows in his research of email exchanges that intercultural communicative competence is powerful if a receptive audience is present; however, getting these exchanges wrong leads to the opposite effect of negative exchanges that do not build community. It therefore became essential that the MOOC team used forums and interactions effectively in an open and understanding way that encouraged cross-cultural communication and not intimidate individual students. Colloquially, as Tella (1996) asked through his title if foreign language on the Internet would promote "harmony or hell," the goal was to promote multicultural harmony in this MOOC through a strategic approach.

The next area of literature explains how this article has the potential to begin to fit within theoretical paradigms. In an introduction of sociolinguistics and computer-mediated communication, Androutsopoulos (2006) advocates for a "more complex theorizing of the social and contextual diversity of language use on the Internet" (p. 430). However, upon reviewing this literature, the MOOC team realized the study does not have the capability of causing major theoretical leaps, but still may advance this strand of scholarship in that the study shows the practical implications of situations in which diverse cultures and online learning in primarily-



English courses converge. This MOOC instantiates this convergence. The team attempted to manage the challenge imposed by the convergence in the most efficacious way possible to achieve MOOC community outcomes.

Another study that helped craft the design strategies was the work of Mackness et al. (2010), which shows in MOOC settings that autonomy, diversity, openness and connectedness/interactivity present paradoxes which are difficult to resolve. The more autonomous, diverse, and open the course, the higher the potential for learners to be limited by the lack of structure and the more they engage in traditional groups as opposed to an open network. The MOOC team sought to find the right balance between structure and openness while including students from a variety of cultural backgrounds. To help prepare the team to use the best practices in achieving these goals, the team turned to the work of Viswanathan (2012) who shows that “learning is promoted when participants share their views with everyone, interact with the reading material and participate during sessions” (p. 37). He concedes that MOOCs sometimes have struggled in these endeavors and suggests that teachers need to “encourage students to actively participate and learn by collaborating with others.” These advisories informed the strategies the team incorporated into the MOOC design.

Additionally, the Community of Inquiry (COI) framework guided the implementation of community-based practices in the MOOC. COI explains there are three critical elements to fostering an effective online learning experience: cognitive presence, teaching presence, and social presence (Garrison, Anderson, & Archer, 2000). As Garrison and Arbaugh show in their review of the research related to this framework (2007), social interaction in an online course leads to more effective course outcomes. Several studies support this claim, while also showing that these characteristics allow students to enjoy the course more (Arbaugh & Benbunan-Fich, 2006; Hwang & Arbaugh, 2006; Williams et al., 2006; Yoo et al., 2002). Further, in a study that our CIC team members published in 2016 (Pursel et al., 2016), it was found that students who engaged in discussion forms and posts were more likely to complete the MOOC. In addition, Pursel et al. (2016) found that non-native English speakers who self-identified as fluent in English were more likely to complete the CIC course than native English speakers.



The use of the COI framework means that the endpoint of this article is to understand course community in one MOOC and consider how the team's strategies did or did not enhance community. The team used quantitative indicators to inform understandings, but mainly understood how the team's methods improved community, as observed with increased number of discussion forum posts and study groups. The role and size of the team did not allow for employment of robust qualitative instruments and detailed coding schemes because the team made the decision to forgo these in order to provide "customer service" and adhere to IFF principles instead of employing the time-intensive strategies needed for richer qualitative research. This means that the findings here should be understood as perceptions that help frame upcoming and more specific research investigations. The article is the reporting of results, and a practical explanation regarding the capabilities and struggles of the team's approach to improving teaching creativity at scale and enhancing community in a MOOC.

Turning to literature on MOOCs more broadly, there are two types of MOOCs that have been discussed so far, namely cMOOCs and xMOOCs. cMOOCs rely on connectivist and constructivist approaches to learning through interacting networks. xMOOCs are based on behaviorist approaches to learning, in which a specific curriculum is delivered from course instructors. The cMOOCs are related to the initial launch of MOOCs in Canada with the course on Connectivism and Connective Knowledge in 2008, while xMOOCs are related to the startups of Coursera and edX platforms from Stanford and MIT, respectively (Daniel, 2012; Siemens, 2012; Rodriguez, 2013). As per the two-type MOOC classification, our MOOC falls primarily under the xMOOC type, but aimed to incorporate cMOOC characteristics, especially with an emphasis on learning communities during the second iteration of the course. The blending of cMOOC and xMOOC characteristics, a salient feature for the CIC course, is a direction relevant to other MOOC courses emphasizing creativity, innovation, and entrepreneurship (Welsh & Dragusin, 2013). Furthermore, the study complements prior research that argued for social dimension incorporation into asynchronous learning networks (ALNs) for the courses to be more effective in terms of constructing a sense of community among the students so that they feel as insiders rather than outsiders in the online learning environments (Wegerif, 1998).



Data and methods

The findings and insights presented in this article derived from the CIC MOOC data. Through the partnership with Coursera, research team members can request different types of data associated with MOOCs offered by their institution. The types of data include information about students, how they engage with course materials (such as videos), and assessment submission and course completion information. The team also administered pre- and post-course surveys to collect anonymous data about students' backgrounds and responses related to intended behaviours and motivations in/for the MOOC. The study is part of an umbrella approval by the authors' Research Protection Office. In the present study, we refer to data sources to substantiate our arguments about the different course innovations and strategies, without a systematic analysis of specific student samples who took the MOOC. To this end, data were extracted either from the CIC MOOC platform or from the pre-, and post-course survey that was administered. The pre- and post-course survey were designed with Qualtrics software, shared with all enrolled students, however only about 10% of them returned the survey. For this article, we don't use statistical models for correlational analyses; instead we extract information from the surveys or from the CIC MOOC platform to identify and discuss innovations that potentially lead to improving the course in terms of making it more accessible to diverse language learners.

This exploratory and descriptive study relied on a learning analytics framework to guide the analysis as per the research question addressed. Learning analytics implies the use of intelligent data, learner-produced data, and analysis models to discover information and social connections, and to predict and advise on learning (Siemens, 2010; Clow, 2013). To this end, learning analytics framework contributed both to complete the study, and also to revise our MOOC with the purpose to improve student engagement and learning in/with the course. Here we also follow the strategy we employed in the MOOC course itself where no specific definitions are provided for creativity, innovation, and change. Rather, the MOOC is offered as a platform for learners to start thinking about and applying skills that could potentially lead to creativity, innovation and change in their own context, irrespective of what meaning and definitions they ascribe to these concepts individually and/or theoretically.



Findings

In the next sections, we briefly discuss the course structure innovations more broadly, then follow with more elaborate presentation of the three specific strategies intended for fostering learning communities, and how they enhanced the sense of community within the MOOC during the second iteration of the course. With regard to community fostering strategies, we report only on the actions taken within the course site in Coursera platform, and thus do not cover the interactions that took place outside of the course site, since many students were also independently using social media such as Facebook, LinkedIn, and Google+ to communicate, collaborate and interact with one another.

Course Structure Innovations

While in the first course iteration, the content and video lectures were distributed along eight weeks, with each week covering a specific topic or issue by a number of course instructors, for the second iteration, the course was streamlined along the four course ideas, as noted above, namely Intelligent Fast Failure (IFF) and Innovation, Creative Diversity, CENTER, and Value Creation. This design decision was made in conjunction with a second decision that shortened the course from eight to six weeks. For both of these decisions, we relied on learning analytics from the first iteration, when it was observed that students “dropped out,” meaning they gave up watching videos and completing assignments dramatically after week six. As a result, the whole course structure and content was reshuffled to fit the six-week format. The third design decision pertained to introduction of peer assessments, meaning that student submissions would be automatically assigned to peers in the course for review and assessment. One challenge for the peer assessment was the requirement for all submissions to be in English since it was logistically impossible, for example, to assign submissions in Chinese, to peers who speak Chinese. Peer review, and how it contributed to student engagement is further elaborated under below.

Community fostering strategies

Considering purely quantitative data, the team’s efforts did not enhance traditional indicators of course success. In both the first iteration and the second iteration of the course, course completion hovered just over 3% of initial registered students. In the first iteration 7.9% the active students¹

¹ The team considered as “active” any students who did anything within the context of the course (watch a video, submit an exercise, etc.) while “non-active” were those students who enrolled in the course but never

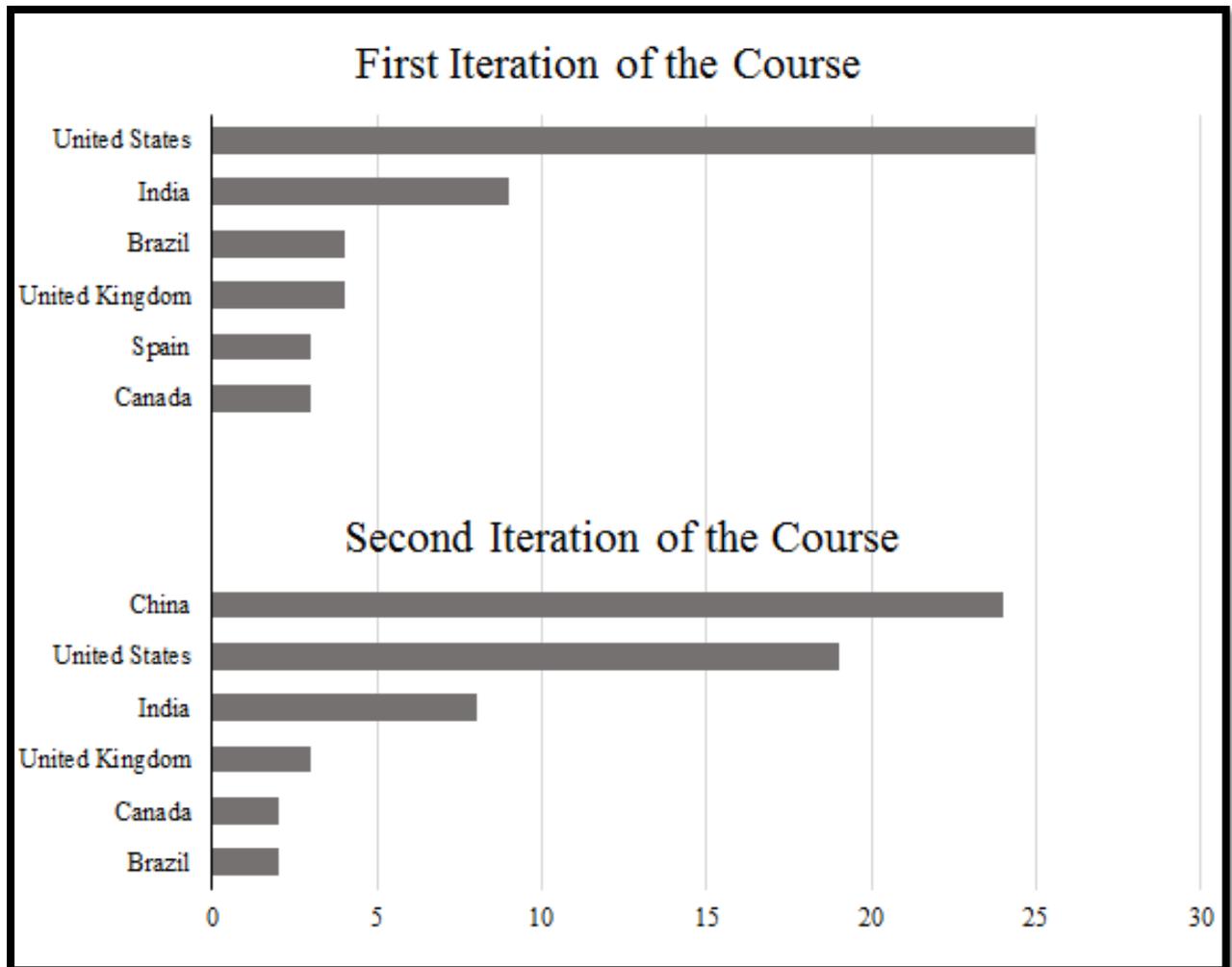


completed the course and 9.7% participated in the discussion forums, while in the second iteration these numbers were 6.3% and 6.7% respectively. In the first iteration of the course 43% of all enrollees actually were active while in the second iteration of the course 49.5% were active, which suggests that the strategies potentially drew more people into the course itself but did not yield increased completion or discussion board participation. With these indicators in mind, qualitative indicators seem to show the opposite, supporting the notion that the three strategies of translations, peer review posts and volunteer teaching assistants enhanced the course experience for users. These indicators are discussed in detail below.

Translations. The translation strategy for the course is straightforward: The team hired two translators to convert all of the text in the course to Mandarin Chinese. These translators also uploaded Chinese subtitles (instead of relying on Coursera's volunteer translation team). Finally, the translators were the first line of response for questions from Chinese students about the course. The percentage of Chinese students who enrolled in the course was the largest proportion of students – even more than that of United States. Figure 1 depicts the demographic composition of course enrollees disaggregated by country in the first and second iteration of the course. A lack of access for Chinese students in 2013 likely also played a role in this enrollment swing, but the growth happened to an extent that it appears the signal of translating the course did help increase the proportion of Chinese enrollees.

Figure 1. MOOC Percent of Course Enrollees by Country, 2013-2014

participated in a single session. Some students enroll to browse the content but never actually participate, which makes them, by this definition, non-active students.



The effort of the team translators seemed to increase general satisfaction among MOOC participants. The only complaint the team received about the translations was that students wanted more of them and wanted them uploaded faster. This request for additional and faster translation work put further stress on our translators, but indicated their work was valued. An additional strength of the translation strategy was that hiring students to translate the course allowed a more consistent flow of translations. The team knew that the translations would be complete and accurate because they were done in-house as opposed to relying on Coursera's offering of volunteers translating the videos only. Hiring translators also allowed for more direct feedback to Chinese students within the Coursera platform without relying on outsiders, which is especially important because the team encountered questions from Chinese students in Chinese.



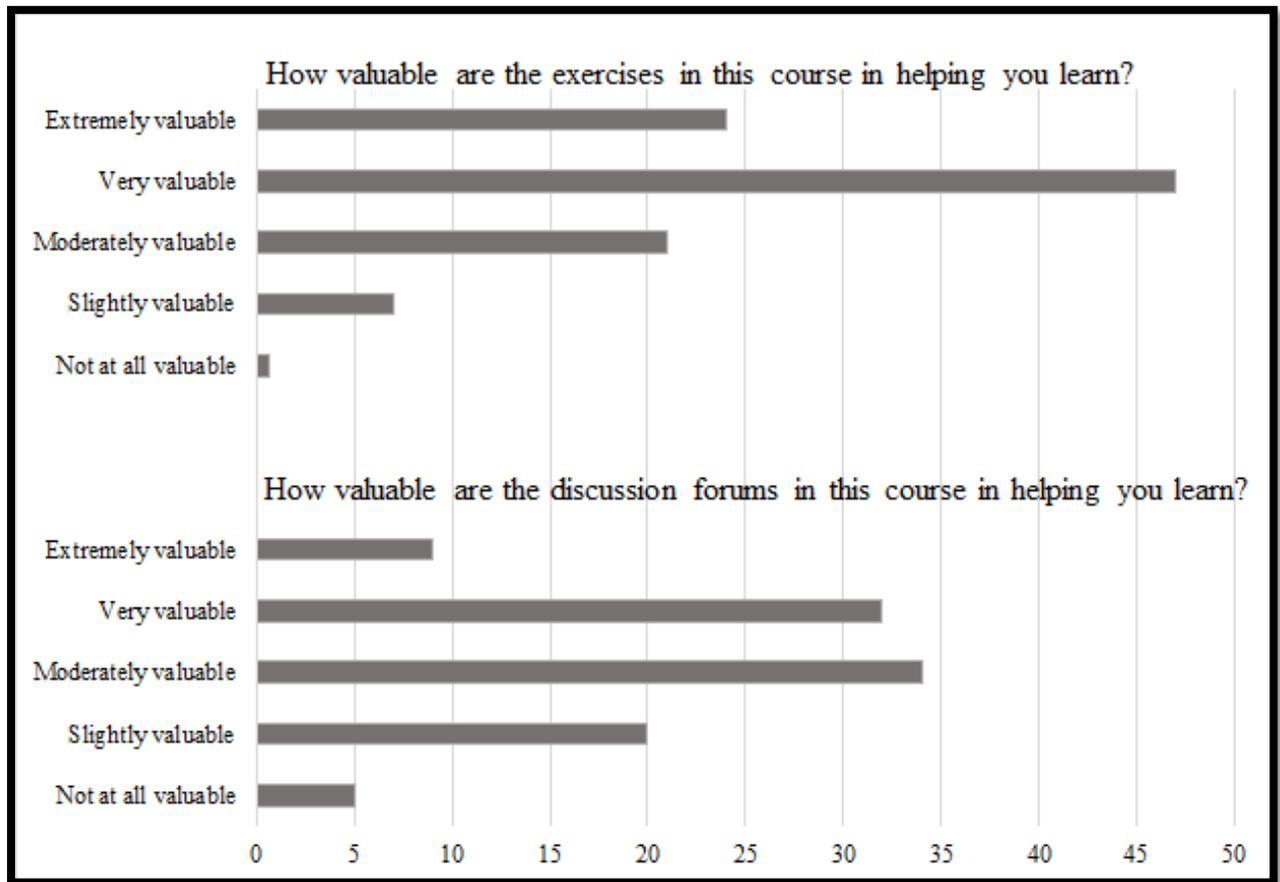
One weakness of the translation strategy was that due to the nature of the course platform, the team needed to only accept assignments in English. This meant that often students produced assignments that English readers had difficulty understanding due to the imprecise nature of the Google translate tool so often used by students. Some Chinese students even took this part of the course to another platform so they could complete and share their assignments to a Chinese audience. This is a drawback because the language constraints at times fragmented the community we hoped to build, thus detracting from the primary goal.

Peer Review/Discussion Forum Posts. The discussion board conversations developed in (positive) ways the team did not expect. For example, in addition to a Chinese-only discussion forum threads, there were threads in other languages that emerged to create study groups of different languages such as Spanish. There were also discussion threads of mixed cultures conducted entirely in English. The unintended positive consequence here was that when the team made a discussion thread in one alternative language (Chinese), students in other languages decided to mirror these threads for students of their language group, such as in Spanish, French, Afrikaans, Polish to name a few.

The implementation of peer assessment also provided students with wider resources and greater opportunities to be involved in high quality discussion and information exchange, thus leading them to stronger community interaction. There were more than twice as many students who submitted assignments for peer review compared to identical versions of the submissions that did not have an option for peer review. This suggests that students embraced components of a course with connections to peer collaboration.

Additionally, adding a peer review element encouraged students to engage with other students in the following way: If a student wanted to receive a higher credential in the course, that student was required to complete peer review submissions. This engagement encouraged cross-cultural dialogue because the system randomly selected the peer reviewers, so, for example, a Chinese student seeking the highest level of credentials in the course might have to communicate with a student from Spain. Figure 2 indicates that active students generally rated the peer review exercises and discussion forums favorably.

Figure 2. Percent of Value Survey Respondents Gave to Exercises and Discussions



The positive result from the combination of English-only peer review and discussion boards in multiple languages was that the team was able to foster a mix of both inclusivity and cultural comfort. Non-English speaking students were able to complete the English components of the course more easily due to the presence of native language support groups. As noted, Image 1 shows examples of the formulation of these groups. However, one additional difficulty with discussion boards in several languages is the only way to monitor the conversation was to ensure that we had team members or CTAs who spoke the language used on each discussion board. This was not feasible in all cases.

One weakness in the team's design choices came from the paradoxical inability to predict some of the positive results of the team's strategy. Since discussion boards of various languages emerged during the course, it was difficult to plan to use this unintended consequence as completely as the team would have wished. If the team had created the discussion boards in several languages from the start of the course, the team could have provided explicit instructions from the beginning and



guided the direction of these boards. Another difficulty with the peer review was that often students typed exactly the minimum requirement of words in the peer feedback. If the peer review forum instructions stated that the students needed a minimum of ten words, then the students would write ten words. For the third course iteration, the team made the minimum word default the ideal response length instead of a minimum response.

Volunteer Teaching Assistants from Different Backgrounds. Engaging a group of the MOOC's past students as CTAs was the third strategy the team employed to foster community during the second iteration of the course. The team solicited CTA responsibilities from the most active students from the first iteration of the course, identified based on their number of forum and comments posts. These students were asked to share their availability to serve as CTAs as well as their interests in topics they were most passionate about in the content of the course. A recruitment survey was sent close to 1,000 students and from them, about 100 students responded, from whom, a final group of 34 students were assigned the role of CTAs. Based on their interests and background, CTAs were divided in groups to monitor discussion forums and encourage dialogue and exchange of ideas, week to week, along the lines of specific course topics. The CTA manager oversaw the entire process of identifying potential CTAs, clarified their roles while the course was in session and handled day to day issues.

One clear advantage of using CTAs was that managing discussion forums became more efficient and effective. CTAs either provided the responses to student questions or brought those questions to CTA manager's attention. CTA availability contributed to positive results in addressing students' questions since the CTAs lived all around the world and in many different time zones, meaning that some CTAs were always "on duty." However, one of the weaknesses included the misunderstandings and confusion created by a few CTAs, whose English language skills were not as proficient as the team had hoped. One challenge the team had to overcome was to clarify the CTAs roles during the first week and reshuffle them from one topic to another that potentially was a better fit for a given CTA.

The volunteer CTAs strengthened the community engagement because almost every student post was read by a CTA. The engagement of CTAs ensured that students' questions were answered in timely manner and that every topic of the forums set up by the MOOC team had a designated



moderator to encourage and initiate dialogue among students. Further, they monitored their assigned forums for any inappropriate language and informed course team members immediately if they thought a post was a violation of expected respectable community behavior.

One of the weaknesses was that while the CTAs were passionate learners and willing to see the course succeed, few lacked adequate English skills and, at times, their language ability stood in their way. Instead of helping, there were cases in which a CTA response was linguistically-deficient and neither students nor members of the MOOC team could understand the point a CTA was trying to make. To address the issue, the CTA manager had to remove a few from the CTA list and move others to different forums where their English skills would not be as much of a barrier.

Another issue the team faced was lack of Chinese CTAs. As mentioned, there were two Chinese translators who covered the gap and provided feedback and support to Chinese students. Some Chinese students migrated to outside Chinese MOOC platforms (a third party non- Coursera platform) to follow CIC videos and participate in discussions. Some of these students were not particularly active within-Coursera discussion forums, presumably, due to language barriers, but were active in third-party platforms such as Guokr, which both promoted and hosted course videos and resources. In this regard, the numbers do not capture the full intensity of students' discussion forum posts and comments since the numbers do not include the interactions of students posting in forums hosted outside the Coursera platform. While the team is confident that course participation, collaboration and community was richer in the second iteration of the course than the first, these migrated students show that the team could not capture everyone.

Ultimately, the result of the team's strategies with the forums and the CTAs was mixed, leaning toward favorable. The forums ran more smoothly than had been the case during the first iteration of the course and the team considers the addition of a CTA component provided positive aspects of community and peer collaboration. There were still drawbacks. At times it was difficult to manage the CTAs and they performed at a range of levels. Also, regardless of the team's efforts, some students did not participate in the community and used other outlets to discuss the course. These challenges aside, the overall community and experience of students in the course seemed richer due to the presence of the CTAs and discussion forums.



Discussion and Conclusions

Research on MOOCs in general is still at an early phase and any contribution to the field will bring new insights into understanding student experiences in the MOOC platforms. This article on understanding how to promote community with linguistically diverse students when aiming to teach creativity at scale contributes to better understanding the needs and challenges of non-native speakers in the MOOC platforms. This is an important endeavor because the MOOC platform is truly global and educators need to learn how to use this platform to create community with global audiences. This article is a first step because the findings provide only a preliminary account of experiences with a course and are supplemented only with rudimentary qualitative and quantitative techniques. However, the experiences of the team are valuable in that the team here is sharing their goals, the perception of how well the strategies worked and the drawbacks emerged.

Overall, the design decisions pertaining to streamlining the course along core ideas, shortening it from eight to six weeks, and introducing the peer assessment system contributed to making the course more coherent, manageable, and demanding. The team relied on IFF and learning analytics to quickly adjust the structure and format of the course so that it is more in line with expectations and motivations of the global audience on one hand, and more tailored towards more effective learning and collaboration on the other.

The Chinese translations in the course seemed useful and had unintended positive consequences of signaling to students speaking other languages that they could start forums in their own native language. At times this strategy posed challenges because MOOC team members could not be sure if all content was accurately disseminated, but overall the community of the course became richer due to these unexpected, non-sponsored interactions. In a sense, these alternate language forums served as support groups for students especially since these students had to complete exercises in English. Translation resources were challenging, but the team's university is large with a great breadth and diversity of human capital that enabled the team to find Chinese translators in-house. This capability might be more difficult for smaller colleges or universities with a less diverse and/or smaller international populations. The peer review and discussion forum posts helped offer an outlet for community engagement and did so in a multi-lingual way. However, while this resource was available to the students, the quantitative "outcomes" of the course did not improve. The



MOOC team did see the experiences of individual learners as richer than would otherwise have been the case, but this did not translate into metrics such as increased course completion rates. The use of volunteer CTAs had benefits but at times proved difficult to manage. Their availability made it possible for the MOOC team to have timely information on anything that students asked or needed clarified. For the students themselves, CTA responses created a sense that their questions were addressed in timely and effective ways. The CTAs were active community builders and initiated dialogue and interactions to deepen student engagement with the course content and exercises.

Taken together, the contribution of this article about streamlining and shortening the course, translations, peer review and discussion forum posts and volunteer teaching assistants is a starting point for considering MOOC community engagement research. More importantly, this article is significant because understanding opportunities and barriers to community in a MOOC platform will provide constructive feedback to the design and structure of the future MOOCs as they expand into developing countries where students speak a wide variety of languages, especially in loosely defined domains such as creativity. Given the promise of MOOCs to provide free quality education to the world, understanding of non-English native speaking students and assisting them to being part of the learning community is a key element for designing appropriate learning and assessment opportunities in the online environments.

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