
Group Formation in MOOCs

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Abstract

For the most part, group formation in MOOCs has not extended beyond random grouping or relying on students' own initiatives. While there is a great deal of literature that addresses how to facilitate collaboration within existing groups, there is far less that addresses ways to group users. Through firsthand experience and a literature review on existing MOOCs, we identified three primary barriers to sustainable group collaboration in MOOCs: the current environment is neither engaging, digestible, nor empowering for users. We have sought to create a grouping mechanism that takes these concerns into account as a means to increase individual motivation and engagement with course material as well as to promote peer interaction and collaboration. We are in the process of designing a tool for Peer 2 Peer University's Spring 2014 Learning Creative Learning course that seeks to aid the formation of project teams based on group dynamics, shared interests, personality, and other factors that we have identified.

Author Keywords

MOOCs, group formation, peer interaction and collaboration, motivation and engagement, peer-to-peer learning systems

Introduction

By far one of the most prevalent marketing points used by MOOCs over the past few years has been the ability to learn alongside a multitude of learners from a diverse set of backgrounds. From claims such as "Learn with 4 million Courserians" [2] to edXs "Meet New Friends: Use the latest in peer-to-peer social learning tools to connect with smart and passionate people, just like you, from around the world" [3] it is evident that the flagship xMOOC providers (i.e. Coursera, edX, Udacity) assert both peer interaction and collaboration as central tenets of the experience.

Many have questioned the MOOC acronym, wondering how 'open' these copyright protected courses are [12], or if they should even be termed courses at all [4]. However, with enrollments ranging from hundreds to hundreds of thousands students, most are in agreement that the 'M', for massive, has earned its keep. However, many of the courses offered by major xMOOC providers are essentially members-only YouTube knockoffs, with one-directional learning and little, if any, chance for collaboration amongst users. In fact, not one of these platforms has incorporated an internal messaging system for students to communicate directly with one another, but rather have routed all communication through a central discussion portal, designed in a traditional forum style. That is to say, MOOC users rarely experience any meaningful difference between taking a course with 10 peers or 100,000 peers. This issue is problematic, particularly with peer collaboration espoused so frequently as a central component of the xMOOC experience.

In a recent poll of 75,000 Coursera users, only 33% of claimed that they currently enjoyed engaging with other users, while 75% expressed at least some interest in the potential for future collaborative opportunities.[1] It follows from this evidence that MOOC participants desire

meaningful collaboration with their peers but currently lack the means to do so. With student-teacher ratios approaching 100,000:1, fostering meaningful collaboration amongst students is of particular importance. [9] In the spring of 2013, the MIT Media Lab offered an online course for designers, engineers and technologists called "Learning Creative Learning". Participants were automatically divided into small groups of about 10 people based exclusively on their respective time zones. The hope was that participants would use their team to share ideas, form networks, collaborate, and get and give feedback. However, most of these small group interactions turned out to be neither effective nor meaningful, as evidenced by many responses to the question "What could we do differently?" in the post-course survey, as explicated below.

This example is illustrative of the larger problem we are interested in addressing: learning is a collaborative process. In an online space, interaction and collaboration are not currently well-facilitated by MOOCs and other online learning providers. We believe that these types of meaningful group interactions have the potential to lead to increased participant engagement and motivation, another major problem faced by online learning today.

Problem Statement

The current mainstream thinking of group formation in MOOCs is twofold. Amongst xMOOCs, users are encouraged to participate in course discussions, but are left largely to their own devices to form groups. Within cMOOCs, which prioritize user connections, most grouping is random, or based on personality-agnostic characteristics like timezone (e.g. in Learning Creative Learning 2013) or alphabetical names by town (eg. in MOOC-Ed). Our value proposition is, therefore, also twofold. We believe firstly, that collaboration is important, if not

indispensable, to the learning process, and that MOOCs are severely underperforming if users are not actively engaging with one another. Secondly, we believe that better-than-random groups can be created (or create themselves). That is to say, by collecting the right data and framing it appropriately, we believe that we can productively contribute to better group collaboration in online courses. There are three primary problems with MOOCs that our tool seeks to mitigate:

The platforms are not engaging.

Generally, participants are motivated to sign up for MOOCs in order to learn more about a particular topic [1]. There is no course credit inherent to most MOOCs, and the value of a completion certificate on a CV is still largely unknown. MOOCs therefore must be engaging enough to draw users in simply for the potential learning opportunities they offer. "Member participation and retention depends on member attachment, which is cultivated by connecting members with topics of their interest and like-minded others," writes Ren et. al. [13]. "By attachment, we refer to members affective connection to and caring for an online community in which they become involved. Members who have a strong attachment to their online community are crucial to its success". That nurturing an online community enhances user engagement is not groundbreaking news. However, those MOOCs that have prioritized community attachments thus far (e.g. P2PU, NovoEd), have seldom moved beyond random or completely user-created grouping strategies, leaving many participants unengaged. Calling on feedback from Learning Creative Learning, students responded that "the assignment of random, smaller groups is a gamble", "my group did not gel", and "the group I was in was dominated by one person...which was very off-putting".

The platforms are not digestible.

Most MOOCs rely on technologies designed for small groups (e.g. traditional forums, Google Hangouts) to facilitate interaction in courses with thousands of participants. Anybody who has ever participated in a MOOC has likely been overwhelmed by the intellectual bottleneck caused by the inability of technology to accommodate the sharing of ideas amongst thousands of users. "Even those for whom technological and time zone challenges do not exist may still experience challenges and hurdles to participation," write McAuley, Steward, Siemens & Cormier [11]. "The volume of information that flows through a MOOC can be very disorienting." This premonition was reinforced in Learning Creative Learning, where users wrote things such as, "we got lost in the main group", "it was difficult to maintain conversation" and when one user wanted to switch groups, "it was a challenge to find another small group". With thousands of users, it is easy to feel lost in the 'massive' aspect of a MOOC and not know where to begin when searching for other users to interact with.

The platforms are not empowering.

Despite the claims of working alongside users from around the world, xMOOCs sideline user input at the expense of professors and static content. When asked their motivation for taking a Coursera course, only 1% of users answered that they wanted to interact with other students who were interested in a particular topic (74% of users wanted to learn more about a particular topic, 18% wanted to advance their career prospects, and 7% wanted to earn some form of certification).[1] Bishop [5] writes that, "an online community can have the right tools, the right chat platform and the right ethos, but if community members are not participating the community will not flourish." Hence, the xMOOC value proposition of fostering

a massively diverse learning community can only be realized through the empowerment of its users.

Our Vision

We believe that a meaningful group experience can greatly enhance the quality of learning in any given MOOC. Whether through the creation of study groups in a lecture-style MOOCs or teams in a project-based MOOC, our value proposition is that creating meaningful user collaboration should be at the forefront of all learning. While a great deal of literature [6] [13] [14] [15] emphasizes how to foster collaboration within an existing group, there is much less written about the process of forming groups. Most providers resort to either random grouping, which is not engaging, or simply allow groups to form without any formal support, which is not digestible. By providing users with important information about their peers in a meaningful manner, we believe that we can do better than random, empowering users access to the most pertinent information and giving them the opportunity to select a group on their own.

Implementation

We aim, therefore, to create a stand-alone collaborative tool that can be integrated into any online learning platform. We plan to run our first trial in the Spring 2014 offering of Learning Creative Learning. Below, we explicate how our solutions to the three problems above have integrated into our design.

In order for our tool to be engaging, it must allow users to both enjoy the process of group formation itself as well as buy into the methodology.

Through a literature review, we have identified six primary themes that are relevant and useful in group formation: demographics, shared interests, common goals, group

dynamics, relevant skills [8] [7], and personality.

It is clear that there is no one-size-fits-all formula for grouping, and different contexts will draw on each of these themes differently. For instance, in a study group, Homan's Theory, which states that drawing on common interests is vital for group cohesion, may be more salient than in a project-based course where Exchange Theory, which states that individuals measure the cost-benefit of joining a group based on what they could potentially get out of it. Additionally, individuals will prioritize different criteria for grouping and will have varying expectations for their group experiences. As there is no one right answer to grouping, we want our tool to remain customizable to a variety of courses and personalizable to a variety of users. Our initial prototype was a simple Google Form, containing several survey questions intended to collect data in each of these themes. Several of these survey questions are related specifically to the context of the course that groups are being created for, and it is these questions that are customizable by the professor. We also ask users to indicate which category they would most prefer to have their grouping based upon, which supports our design criterion that this experience be personalizable. We are currently working on building a more robust version of this survey, intended to feel gamified, which has been shown to increase buy-in. [10]

The goal of digestibility is to create an identity for each user, as well as a platform for sharing and networking.

In order for our grouping tool to be digestible, some constraints must be included to limit the amount of data users are exposed to. These constraints could take many forms, including filters that allow users to search for other users based on aforementioned themes or smart recommendations that suggest connections between users. So as to keep the survey short, we enlisted a novel

approach of constraints. Rather than asking users their Myers-Briggs type to assess their personality, we ask them to select from Myers-Briggs, zodiac, spirit animal, or Enneagram and fill out only one. By doing this, we learn two things about the user – which type of personality test they gravitate towards as well as their actual answer. Using constrained information such as this, we will generate a personalized profile for each user, giving them a unique identity that they can then take ownership of. Though these profiles will be unique to each user, they will be unified through a consistent design theme and aesthetic. This will make the profiles digestible and will provide other users with uniformly structured, but personalized clues into how potential group mates might function in a team.

Our tool is empowering for users by placing group collaboration front and center in the MOOC.

We want to allow users to select what choices they want to make and what choices they want made on their behalf when it comes to forming a group. That is to say, we seek to allow participants to self-select a grouping strategy that falls somewhere on the spectrum from algorithmic to organic grouping.

We want users to make informed decisions for their grouping, while simultaneously facilitating the development of both an individual and group identity. Additionally, we hope to promote some type of activity that will allow groups to get a feel for some of the other teams that are concurrently taking the course. This is aimed at increased group identity, through the introduction of an other, as well increased awareness that each small group is a part of a much broader course community. [6] We hope that this process will instill participants with a sense of commitment toward their team, increase motivation and engagement with course

material, and promote peer-to-peer and community-wide collaboration.

Conclusion

We prototyped this survey in a project-based class at MIT amongst the 40 students in the class. Because of our personal relationships with the people in this course, we decided that rather than create an algorithm from the start, we would create optimal groups based on the available data, and then reverse engineer the algorithm based on gathered feedback. We are currently in the process of iterating a weighting mechanism that will lead to optimal results in this class before scaling to a MOOC. Based on these results, we aim to test various methods of creating small groups in the Learning Creative Learning course being offered by the MIT Media Lab in Spring 2014. We hope to run a randomized control trial to measure the effect of our grouping tool on student achievement and satisfaction.

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