Understanding Participation and Persistence in Online Peer-to-Peer Learning

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Abstract: We present early work seeking to understand participation and persistence in online, peer-to-peer learning environments. We obtain log data from the Peer-to-Peer University (P2PU) and: (1) outline our methods to move from raw data to developing metrics that can help explore how to promote deeper participation and persistence rates in open courses, and (2) describe some preliminary findings about different metrics of participation and persistence in P2PU, culled from their log data.

Introduction

Open, online learning is a fast rising phenomenon in computer supported collaborative learning (CSCL). The growing library of open education resources (OER) combined with increased technology availability has created trends toward massively open online courses (MOOCs). Highly visible ventures such as Coursera, Udacity, and EdX have garnered much attention by attracting tens of thousands of learners (and sometimes hundreds of thousands) to their courses (Pappano, 2012). There are also other types of open online learning paradigms that are more learner-driven, bottom-up, and peer-to-peer. One such platform is the Peer-to-Peer University (P2PU), which is the focus of our research. In all of these different online learning platforms, the issue of learner participation and persistence is critical. Only a small number of learners even finish many of the high profile MOOC courses (Pappano, 2012), and peer-to-peer learning platforms are directly dependent on teacher and learner interactions to keep courses robust and active (Ahn, Weng, & Butler, 2013). A ripe area for future research is to understand metrics of participation and persistence in open, online learning. In this poster, we describe our early research with raw log data of the P2PU platform. We outline our methodologies in working with this data and preliminary findings about potential metrics of engagement that will inform future work.

Methodology

This study is a part of an ongoing partnership with P2PU where we are exploring how to create publicly sharable datasets and conduct analyses of this widely used open education platform. A major challenge of this type of research is to transform raw log data into a usable dataset that can be used to derive insight into open, online learning. We obtained data from P2PU that represented a log of all elements of the platform (e.g. courses, users, and learning activities etc.) in addition to all interactions that learners have had. This data captures a live snapshot of the system in July 2012. All measures represent the system at that point in time.

We used SQL to identify the tables, relationships, and data they contain. We also conducted direct observations of the P2PU.org website to identify how members go about: (a) joining learning communities, (b) interacting with peers, and (c) participate in learning groups. We then identified how these interactions with the P2PU.org community were represented in the underlying database structure. One critical issue in online platforms surrounds participation and persistence in open courses, so we concentrated our data investigation on understanding the characteristics of users and courses. We also developed a descriptive understanding of the P2PU ecosystem. Some of the characteristics we explored include: categories of courses in P2PU, the status of courses, the participation levels in courses, and the grouping of courses into schools.

Another goal of this initial analysis was to derive variables relevant to concepts of participation, engagement, and persistence in courses. Working from the data structures provided in the P2PU platform, we defined three types of measures that could be salient for future studies:

1. **Basic engagement**: The P2PU data allows us to track basic measures of course participation such as the number of participants, followers, and organizers associated with each course. We can also understand participation from the user's perspective, such as how many courses on average a user is a participant in.
2. **Active participation**: Beyond basic counts of participation, we also defined examples of active participation where users make explicit contributions to P2PU courses. These measures include statistics such as the number of comments shared in courses or learning groups.
3. **Metrics of Persistence**: We were also interested in measures that reflect whether learners complete learning tasks and progress through courses. We derived two types of metrics from the P2PU log data.
    a. Task Completion Rate – Many P2PU courses have tasks that learners are asked to complete. We were able to derive an average completion rate for each P2PU course, which was found by calculating how many tasks on average, participants completed, divided by the total number of tasks designed in a given course. In this way, we may be able to compare the completion rates of different types of courses in P2PU in future work.

b. Badges Earned Rate – Learners can also earn digital badges in the P2PU platform. Badges serve many social and educational functions (Antin & Churchill, 2011; P2PU, 2012). We are able to track the total number of badges earned by each learner across courses, in addition to the badges that could be potentially earned in a given course. Using these metrics we can calculate a metric of badge earning rate in each course, dividing the average number of badges a person earns by the total number they could potentially earn in a given course.

Preliminary Findings

Descriptive summaries of the measures are included in Table 1. We found much variation between P2PU courses in terms of the level of participation as well as in the range of activity.

Table 1: Descriptive summaries of participation and engagement measures across P2PU course

	Mean	Std.Dev	Median	Min	Max
Basic Engagement					
Organizers	1.5	3.712762	1	1	98
Participants	32.0	88.32164	8	1	853
Followers	5.7	31.46898	1	1	594
Participation	3.9	3.8	2.7	1	24
Active Participation					
Comments/Posts	12.5	44.2	2	1	388
User Achievement					
Task Completion Rate	51%	20%	50%	2%	90%
Badges Earned Rate	62%	27%	50%	18%	100%

In addition to targeting the specific engagement measures, this research also allows us to create a descriptive summary of the ecosystem of P2PU. The components of that ecosystem are the schools, courses, learners, tasks, and badges. We have identified 6 schools in P2PU. There are 1333 total courses. Of these 25% are active. Courses belong to course types: Study Groups (57%), Challenges (17%) and Courses (26%). A total of 34,777 learners have created accounts with P2PU, however only 4,576 are active participants, learners who have returned to the site multiple times, registered for multiple courses, or created content posts. Finally, as learners progress through courses, they complete tasks and earn badges to mark their progress. Badges are used as a tool of motivation to keep the learners engaged in the courses. Task completion and badge earning measures are described in Table 1.

Discussion and Conclusion

This poster describes the very early work we are undertaking on open, peer-to-peer learning in P2PU. We have begun the process of converting log data into usable datasets to glean deeper insight into the P2PU platform, and how learners participate in and persist through open online courses. Initial descriptive analyses are presented here, but these metrics of participation and engagement will serve as the foundation for future research. For example, in future work we plan to examine whether the characteristics of courses and learners in P2PU relate to metrics of persistence such as completion rates and badge earning. These future studies promise to shed light on factors that might help improve learner engagement in open, online learning, which is a topic that is gaining tremendous traction and visibility in the coming years.

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