

Workshop on Integrated Learning Analytics of MOOC Post-Course Development

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ABSTRACT. MOOC research is typically limited to evaluations of learner behavior in the context of the learning environment. However, some research has begun to recognize that the impact of MOOCs may extend beyond the confines of the course platform or conclusion of the course time limit. This workshop aims to encourage our community of learning analytics researchers to examine the relationship between performance and engagement *within* the course and learner behavior and development *beyond* the course. This workshop intends to build an awareness in the community regarding the importance of research measuring multi-platform activity and long-term success after taking a MOOC. We hope to build the community's understanding of what it takes to operationalize MOOC learner success in a novel context by employing data traces across the social web.

Keywords: MOOCs; learning analytics; long-term development; learning outcomes

1 Introduction

1.1 Challenges in assessing MOOC Learner Success

MOOC learners access course content in an asynchronous and unconstrained fashion [3, 12]. This has resulted in fragmented data scattered outside of the course platform and beyond the course-offering window, causing challenges of collecting learner data. As a result, much research in MOOCs focuses on learner achievement and engagement during the course itself, leaving the area of post-course student longitudinal development relatively untouched. This lopsidedness in MOOC research reduces our understanding of the role that MOOCs can play in 21st-century learning.

It is observed that the narrative on MOOCs has shifted from overwhelmingly optimistic from 2011 to 2014 to substantially more critical in 2015 [12]. One concern is that it is not clear how well MOOCs support student learning and career development

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in response to changing societal needs [6]. The development of technology and scale of online education considerably outpace efforts to evaluate and understand how well it is succeeding at improving outcomes. The predominant focus of studying MOOC completion without considering learners' longitudinal development overlooks the possible role that MOOCs may play in the long-term professional development of many of their users.

Responding to this challenge, an emerging trend has been seen on identifying and tracking MOOC learner development outside of the course platform and beyond the conclusion of the course [1, 13], such as tracking learner activities on relevant social web platforms, measuring learner post-course development on career advancement, and measuring learner participation in communities of practice related to the MOOCs they engage with.

1.2 Post- MOOC Development

1.2.1 MOOCs and Continued Learning Activities

Currently, the most popular approaches adopted by researchers to evaluate a MOOC's success is to measure its learners course engagement and performance. Although this can provide us with some insights, some researchers argue that students' post-course learning activities should also be tracked and analyzed to gain a better understanding of learner behavior.

One key aspect in these post-course learning activities is to what extent learners apply the knowledge they acquired from a MOOC in practice (i.e., learning transfer). One example of such research comes from Chen et al. [1] which targeted the learners from a MOOC teaching functional programming in edX and analyzed the data they generated in both edX and GitHub, a social repository for programmers to store and share code. They found a small percentage of learners began using the taught language who had never used it before and continued to do so after the course ended.

In addition to measuring learning transfer, another interesting aspect to investigate is whether learners continue to study the MOOC subject or related topics after the end of the course. Just as Chen et al. [1] used GitHub to measure learning transfer, Chen et al. [2] analyzed learners' data left in StackOverflow, a social platform for programmers to ask and answer questions, and observed that some learners continued asking relevant questions after the course finished. Moreover, some of them even changed their role from "learner" to "teacher" by answering these questions. As learners' continued learning activities are greatly diverse, we here identify a need for new approaches to identify and measure such behavior.

1.2.2 MOOCs and Career Development

Instead of pursuing a degree in a traditional school setting, a considerable percentage of MOOC learners are seeking career advancement through taking MOOCs [5].

In addition to showing interests in accumulating competency, many MOOC learners have also expressed explicit goals of changing their careers. For instance, recent studies on MOOC learner motivation suggest that a substantial proportion of learners register

for a MOOC with an intention of changing their job [9]. Proactively seeking to change one's current job is correlated with higher perceived employability by employers [7].

More recently, Dillahunt and colleagues [5] conducted a survey and found out that enhancing employability was a key reason why many learners enroll in MOOCs. They categorized desired career advancement for MOOC learners into four types: transition into a new field; promotion in their current fields; obtaining new position in current fields; and improving current job skills. However, while learners have the goal of increasing their employability and many employers are interested in prospective employees' MOOC experience [9], there is not yet much evidence of post-course career improvement as a result of taking a MOOC.

1.2.3 MOOCs and Communities of Practice

In addition to post-course development analyzed on the individual level, development of a community of practice complements the development of individual learners. This can be particularly relevant for a MOOC in an emerging field since the field needs to attract new members in order for it to grow and develop. Communities of practice refer to groups of people who share a common interest and learn how to enrich a shared repertoire of their practice via joint activities [10]. Learning transcends personal knowledge acquisition and becomes a dynamic, interconnected bank of knowledge shared among community members [11]. Becoming a member of a community of practice is also considered beneficial to career advancement on the individual level [4], for example, by moving from being a novice to a full practitioner in the community. The emergence of virtual media further extended the realm of communities of practice [8].

MOOCs, as a virtual learning venue, often connect to a community of practice around the domain of the MOOC's content. For example, a MOOC teaching methods in the emerging field of educational data mining (EDM) is likely to attract learners who are interested in joining the community of practice composed by the field of EDM. MOOC learners can be perceived as aspiring practitioners in this community of practice. With their lack of entrance restrictions, MOOCs can provide a new space to facilitate legitimate peripheral participation. For an emerging field, fostering development of the community of practice can be crucial, and there is initial evidence that some MOOC participants join relevant scientific societies during or immediately after participating in a MOOC [13]. This development does not stop at the moment when the course concludes. Therefore, studying the development of MOOC participants as members of the community of practice after the MOOC concludes can be a valuable lens for understanding the impact of the MOOC.

2 WORKSHOP OBJECTIVES

This workshop aimed to generate awareness in the community that considering learner data beyond the course platform and course-offering window can uncover previously unconsidered learning behaviors.

As such, in adopting and developing this integrated learning analytics approach, the overall goal of the present workshop was to bring together researchers and practitioners from different disciplines and areas of expertise to herald a new MOOC research branch on tracking and analyzing longitudinal MOOC learner development.

Presentations on finished, ongoing, and proposed studies, as well as facilitated discussion sessions are planned to develop a preliminary framework to illustrate the current development of the field and to inspire attendees to come up with exciting new lines of research of their own. Toward building this framework, the following guiding questions are included:

- Data source: Where and how can learner post-development data be collected?
- Tools: What analytical tools are useful in analyzing datasets merged from multiple sources?
- Methods: What analytical methods have been used? What other methods can be applied?
- Generalizability: What kind of practices and findings are domain-general or not?
- Applicability: How can research findings translate into actionable insights for various stakeholders (learners, instructors, administrators, investors, etc.)?

3 Outcomes

The Workshop on Integrated Learning Analytics of MOOC Post-Course Development took place during the 7th International Learning Analytics & Knowledge Conference, hosted by Simon Fraser University in Vancouver, Canada. The goal of this workshop was to foster discussions to rethink how we define success in MOOCs, going beyond performance in MOOCs themselves and thinking about the impacts of the students' participation in online courses in their life and career outside of the courses.

More than 25 attendees from 10 institutions attended the workshop which included presentations from 1 keynote speaker and 4 submitted papers and group discussions. The topics ranged from how to collect learner post-development data to what pedagogical actions can be triggered based on the existing research findings.

MOOC research is typically limited to evaluations of learner behavior in the context of the learning environment. However, some research has begun to recognize that the impact of MOOCs may extend beyond the confines of the course platform or conclusion of the course time limit. The papers published in these proceedings are great examples of the most recent efforts from Learning Analytics researcher to study MOOCs post course outcomes. This workshop encouraged our community of learning analytics researchers to examine the relationship between performance and engagement within the course and learner behavior and development beyond the course. It built awareness in the community regarding the importance of research measuring multi-platform activity and long-term success after taking a MOOC.

As such, in adopting and developing this integrated learning analytics approach, this workshop brought together researchers and practitioners from different disciplines and

areas of expertise to herald a new MOOC research branch on tracking and analyzing longitudinal MOOC learner development. Presentations on finished, ongoing, and proposed studies, as well as facilitated discussion sessions are included. Presentations and discussions of the workshop helped inform a preliminary framework to illustrate the current development of the field and inspire attendees to come up with exciting new lines of research of their own.

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