

# Teacher Perceptions on Collaborative Online Professional Development for In-Service Teachers on a MOOC Platform

Katherine Miller, Graduate School of Education, University of Pennsylvania, [kmmiller@gse.upenn.edu](mailto:kmmiller@gse.upenn.edu)  
Susan A. Yoon, Graduate School of Education, University of Pennsylvania, [yoonsa@upenn.edu](mailto:yoonsa@upenn.edu)  
Joeeun Shim, Graduate School of Education, University of Pennsylvania, [jshim@gse.upenn.edu](mailto:jshim@gse.upenn.edu)  
Daniel Wendel, Massachusetts Institute of Technology, [djwendel@mit.edu](mailto:djwendel@mit.edu)  
Ilana Schoenfeld, Massachusetts Institute of Technology, [ilanasch@mit.edu](mailto:ilanasch@mit.edu)  
Emma Anderson, Massachusetts Institute of Technology, [eanderson@mit.edu](mailto:eanderson@mit.edu)  
David Reider, Education Design, INC, [david@educationdesign.biz](mailto:david@educationdesign.biz)

**Abstract:** This study seeks to address the growing need for greater access to effective, on-demand, low-cost professional development (PD) through the development of a small private online course (SPOC) as a pilot test for a scale-up to a full massive open online course (MOOC). Traditional MOOCs are not designed for collaboration and social interaction among participants that build communities, which has been shown to be an important aspect of effective PD. This study provides insights in designing for collaboration on a traditional MOOC platform (in our case edX). A pilot study was run with a small group of in-service teachers to test a collaborative design with an eye to how the design will scale to a full MOOC.

## Objectives and theoretical framework

There is a growing need among teachers for greater access to effective, on-demand, low-cost professional development (PD) (Fishman et al., 2013). Traditional face-to-face PD is expensive, and limited in relevance, applicability, and ability to scale (Hill, 2015). Online PD is a rapidly growing option that can make it more broadly accessible. PD offered online can be as successful as face-to-face (Fishman et al., 2013). Massive open online courses (MOOCs) provide the opportunity to explore the viability of such online approaches at larger scales. However, there are drawbacks to MOOC participation that pose barriers to implementing effective PD. Collaboration among participants and social interaction that build communities are two conditions that encourage engagement but are not well-supported technologically in MOOCs (Kop, 2011). We seek to design a MOOC that overcomes these barriers to collaboration and community building. In order to do this research, a pilot study was run with a small group of teachers in order to explore how successfully a MOOC platform and framework can be used to encourage collaboration with the aim of eventually scaling to larger participation.

We build on research that positions teachers as knowers and agents of change (Cochran-Smith & Lytle, 1999). This posits that teachers are active participants in building their own knowledge rather than passive recipients (Fenstermacher, 1994). Through a cross-case study Booth (2012) found that social learning was able to build knowledge sharing and trust among teachers. Other studies have demonstrated that collaboration can increase knowledge creation and sharing in an online space (e.g., Duncan-Howell, 2010). In order to encourage collaboration in our SPOC, we built on existing best practices for encouraging collaboration in online PD (e.g. Booth, 2012; Hew & Cheung, 2014). These findings were used directly in the development of the collaborative learning portion of the course and the prompts that led teachers into that space.

## Methods

This paper is part of a long-standing program of research funded by the U.S. National Science Foundation which undertakes the design and dissemination of a curriculum to teach common topics in high school biology through complex systems simulations (Yoon et al., 2017). In adapting the PD for the complex systems curriculum to a wider audience, the PD was moved to an online platform: Edge, the pilot testing platform for edX. We used three design categories which emerged from the literature to promote collaboration throughout the course: 1) periodic required discussions in the online forum; 2) open-ended questions based on course content to prompt the sharing of reflections on practice; and 3) expectation of participant comments on others' reflections. The participants in the first implementation of the course were eight in-service teachers from six different schools in three urban districts in the Northeastern US.

This paper is part of a larger study which collects data at both the teacher and student level over an entire year. A selection of the data from the summer PD was analyzed: teacher enrollment forms, teacher interviews, and teacher post-surveys were used as primary sources of data, while preliminary data from the discussion board posts was used to triangulate some of the findings. We combined the open-ended responses from the enrollment forms, satisfaction surveys, and interview transcripts which were all then inductively mined for themes. The themes were given positive and negative levels and a coding manual was created representing the themes and

levels. Two researchers achieved an inter-rater reliability Cohen's kappa score of 0.87.

## Results and discussion

Six themes emerged in terms of the way that participants collaborate within the SPOC: (a) asynchronicity is a hinderance to collaboration; (b) online delivery is not a hinderance to collaboration; (c) struggle is a motivator for collaboration; (d) participants view each other as resources; (e) not all open-ended questions are created equal; and (f) individual motivations have an effect on collaboration. The course was run fully asynchronously based on assumptions about teachers' available time and schedules during the summer. These assumptions, though supported by some of the teachers' comments, led to a level of asynchronicity that was a hinderance to collaboration. Based on the first finding and supported by previous research that suggests a combination of synchronous and asynchronous technologies create an ideal space for interaction (e.g. Hew & Cheung, 2014) a semi-synchronous design that allows teachers freedom to complete the course on their own time but within a synchronous framework of weeks would be a better design than a fully asynchronous one..

Participants' responses to the question about face-to-face delivery combined with the moments when they most wished for support provides a guideline for when synchronous check ins may be the most useful during the course. Portions of the course where teachers were asked to learn new academic content (e.g., programming, scientific argumentation) were places where participants struggled the most and when they wished for greater collaboration. As participants were shown to view each other as resources, increased synchronicity may be enough to provide peer support to participants at these points of struggle, especially if prompts are modified to ensure that they not only encourage participants to share their thoughts but also be rigorous or controversial in a way that elicits a range of responses. Prompts were designed to do this as per previous research that supports these findings (e.g. Booth, 2012) however, the level to which prompts were successful depended on the motivations of the participants for engaging in the course.

A number of participants commented that though they found reading others' posts useful, they were not motivated to respond. Further research into phrasing for discussion prompts and how they can support active knowledge development is needed to better address the needs and motivations of a diverse participant group, especially as this project moves towards scale. The goal of this project is to scale the current course up to true MOOC participation levels. As such, the small number of participants in our pilot run of the course is a limitation of this study. However, each of the findings presented in this paper has implications for future iterations on the design of collaborative MOOCs for in-service teachers. As researchers develop meaningful PD within MOOCs, a comprehensive list of best practices for creating and sustaining collaboration is necessary. Our research suggests several themes that may be promising for future content development.

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