Learn With Friends: The Effects of Student Face-to-Face Collaborations on Massive Open Online Course Activities

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Abstract

This work investigates whether enrolling in a Massive Open Online Course (MOOC) with friends or colleagues can improve a learner's performance and social interaction during the course. Our results suggest that signing up for a MOOC with peers correlates positively with the rate of course completion, level of achievement, and discussion forum usage. Further analysis seems to suggest that a learner's interaction with their friends compliments a MOOC by acting as a form of self-blended learning.

Author Keywords

MOOC; student success; collaboration; social learning; blended learning

ACM Classification Keywords

K.3.1 Computer Uses in Education

Introduction

Unlike traditional courses where learners attend classes together in real-time, form cohorts, and share classroom activities, learners enrolled in MOOCs interact asynchronously across geographical and

temporal boundaries. Given the low rates of completion associated with MOOCs, we investigated whether enrolling with friends or colleagues would be associated with improvements in both course completion and social interaction in a professional development MOOC. We also explored the types of collaborative activities that learners, their friends and/or colleagues engaged in and how these activities might map onto social learning theories.

We surveyed learners in a single offering of a professional development MOOC to determine whether they signed up with friends or colleagues and, if so, what type of collaborative activities they engaged in outside of the MOOC environment. We used these responses, along with quantitative behavior data collected directly from the Coursera MOOC environment, to answer the following research questions:

RQ1: Do learners who sign up with friends/colleagues have higher completion rates than those who do not?

RQ2: Do learners who sign up with friends/colleagues have different discussion forum posting ratings than those who did not?

RQ3: When users engage in a MOOC with friends, what activities do they do outside of the MOOC environment?

Methodology
In this work, we explore the topic of peer collaboration in a professional skills development MOOC, *Instructional Methods in Health Professions Education*. [1]

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[1] https://www.coursera.org/course/instructmethodshpe

This MOOC has video lectures and quizzes, and uses a heavily structured discourse forum where learners respond to questions the instructor scaffolds. The majority of learners have a background in the health field and practice both as teachers (the focus of the MOOC) and professionals (e.g. nurses, doctors, dentists, etc.). For the session analyzed, the course came at no cost to learners. Our analysis is based on surveys administered at two points within the semester: one at the beginning of the semester (Entrance Survey) and the other midway through the course (Midterm Survey). The surveys were delivered as optional course quizzes. We also analyzed learners' performance data within the MOOC.

Results
The first survey resulted in a 20% response rate and the second survey resulted in a 6% response rate. In the authors' experiences, this is a reasonable response rate for surveys in MOOC environments. Table 1 shows the breakdown of respondents based on whether they signed up with friends or colleagues (*Friends*) or whether they did not sign up with friends or colleagues (*Alone*).

	Entrance Survey	**Midterm Survey**
Friends	243 (23.4%)	76 (24.6%)
Alone	797 (76.6%)	233 (75.4%)

Table 1: Survey Response Rate by Condition

RQ1: Completion Rates
We measured the completion rate by end of course credential, which could be either none (learner either did no evaluative exercises or did not pass the course threshold for minimum grade), normal (user achieved a grade above 80% but below 95%) or distinction (user

achieved a grade equal to or above 95%). A χ^2 contingency test suggests that the two population responses were different ($p = 0.006$).

	Distinction	Normal	None
Friends	34.2%	5.3%	60.5%
Alone	24.2%	4.5%	71.3%

Table 2: Achievement Level by Condition

Table 2 shows the proportions for each category of achievement. Most notable is that those learners who signed up with friends or colleagues achieved higher rates of distinction and normal completion than those who did not sign up with others.

RQ2: Sociability in Discussion Forums
Our expectation was that learners who signed up with friends would be less likely to use the MOOC-based discussion forums as they would prefer to interact with their friends. Our results show that this is not the case. When comparing the number of postings to the discussion forums, an independent t-test was statistically significant ($p = 0.03$) and the mean number of postings per user was higher for those who signed up with friends (**Table 3**).

	$\bar{x}$	σ
Friends	6.96	8.83
Alone	4.86	5.06

Table 3: Mean and Standard Deviation of Number of Posts per Condition

RQ3: How Learners Collaborated Outside of the MOOC
The survey responses from those who signed up with friends also provided an open-ended question asking how learners interacted outside of the course. A

qualitative analysis of the results suggested several themes of interaction including:

- Casual discussions with family members who were in similar job roles and who were co-enrolled in the course;

- Formal study group discussions with colleagues who had signed up for the course, sometimes around specific professional practices such as the planning of teaching assignments;

- Ad-hoc discussions with colleagues who did not sign up for the course, suggesting that the MOOC could impact others in the workplace;

- Formal professional development activities, with learners using this content directly in their teaching practice (e.g. within related higher education courses or mentorship duties);

- Collaborative lecture viewing activities, where learners enrolled in the MOOC would gather in a collocated space to engage with the content.

Conclusions
Through this work we have shown there is an effect on learner academic achievement and online interaction when learners sign up with friends or colleagues. Additional qualitative analysis seems to suggest that learners use their interaction with their friends/colleagues as a type of self-blended learning to complement or perhaps supplement the MOOC. Although social learning theory suggests that individuals can learn by interacting with others [0], more work is needed to fully understand the mechanisms that underlie the peer learning that happens outside of the MOOC environments. Prior research has consistently shown that both the size and actions of one's peer group can alter an individual's

level of engagement [4]. For example are the potential benefits associated with signing up with friends or colleagues due mainly to social support, informational peer tutoring, or a combination of both? Perhaps the differences in completion rates are due to social proof – if this class is important enough for a peer to work on, it must be worth the learner's time too.

In addition, other questions emerge about the mechanisms that may or may not facilitate these learning benefits due to peer collaboration. Do these potential benefits materialize through greater engagement with in-course activities or simply provide benefits derived entirely outside of the course structure? Are these benefits dependent on environmental factors? For example, is the ability to take advantage of peer collaboration related to a learner's social structure [0]? Learners with access to more friends who have better educational experiences may benefit more from peer collaborations. Do some environments offer richer opportunities for peer learning than others (e.g. some employers may setup in-house learning programs/incentives to support peer learning)?

We believe future work in this area has implications for design. For example, the learners in this study interacted with their friends/colleagues in many different ways. Some interactions were technology mediated, such as the co-viewing of lectures in a shared space, while others were not, such as the discussion of topics over a meal. Prior research has shown that the context in which communications take place can influence the quality of interpersonal interactions [3]. By better understanding the ways in which learners collaborate outside of the MOOC we may be able to design collaboration technologies which can

be made available to learners to help support their own learning experiences.

Our future work involves designing studies to provide more detailed analysis and replicating this with other sections of the same MOOC and with other types of MOOCs. Perhaps professional skills courses, such as the one we studied here, are different from general interest MOOCs or MOOCs that are aimed at college replacement courses. The potential improvements due to peer collaboration may be dependent on the level of the learner's education. Nonetheless, the results of this preliminary work open up several potential avenues of research we hope to explore.

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