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Exploring the Use of MOOC Discussion Forums

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Abstract

Discussion forums in massive open online courses (MOOCs) are a primary means of interaction among learners and instructors. Despite their widespread use there is concern that forums are not an effective means of promoting engagement and learning. This paper examines issues relating to forums through a brief literature review and by drawing on data from a specific MOOC run by the University of Warwick. Two parallel delivery modes allow comparison of forum participation. Results indicate that forum use overall is low and that tutor-moderation may close down participants' discussion, while peer-support forums fail to offer adequate support.

Keywords: MOOC, massive open online course, discussion forum, motivation, learner support.

1. Introduction

Discussion forums have been used as online learning tools since the early 1990s and are intended to increase engagement, motivation and reflection, thus leading to deeper learning. Earlier studies have indicated that forums do not support learning as well as might be hoped [1] and that many students resist engagement. The rise of the Massive Open Online Course (MOOC) [2] has underlined the need to support collaborative learning. Despite the concerns, forums have become one of the main tools in many MOOC platforms. However, the common MOOC model allows many thousands of students to each instructor, so forums also take on a major role in both peer-to-peer and tutor-led support.

As more MOOC evaluation is conducted, patterns of forum use and issues relating to both social and educational expectations are emerging. The learners' perspective is also evidenced through learning blogs and the forum posts themselves. This paper first briefly reviews literature relating to forum use in MOOCs. Data from the Computing for Teachers (CfT) MOOC is then presented. Developed at the University of Warwick, CfT was run in two parallel modes allowing direct comparison of peer-supported and tutor-supported forums. We discuss issues arising and future research directions.

2. Literature survey

With large numbers of learners and few instructors, peer communication, support and assessment are seen as key elements of MOOC pedagogy. Forums play a central role in most platforms, with diverse expectations including increasing engagement, promoting deep learning, maintaining motivation and decreasing risk of drop-out [1]. Completing learners are likely to have made more forum posts than non-completers, and forum posting has been cited as an effective measure of student engagement [3]. Despite this correlation, Baxter and Haycock [4] found that although forums facilitate academic integration, they can have a negative effect on student motivation and online identity. At the most basic level, forums are not good at managing high volumes of posts, with topics becoming fragmented over many threads and a lack of search facilities. McGuire observes that forums attract the majority of learner complaints and may be a deterrent to many [5]. Fini [6] found that learners gravitate towards more passive tools, either through preference or lack of time.

Forum discussions often involve a minority of course members, with threads being dominated by a small number of vocal students. Negative and ill-mannered posting is a disincentive to some learners [7]. Schweizer's account of MOOC participation acknowledges the benefit of forum discussion for promoting reflection but expresses frustration at the general level of contribution as being "unfocused, tentative, and frankly, misinformed" [8]. Peer suggestions and answers may be incorrect and counter-productive for the questioner. Course tutors use forums to provide course information, generate discussion and support learners by answering questions. Brinton *et al.* observed that active tutor participation increased the discussion volume but did not slow down the decline in participation [9]. However, in other studies tutor participation did not prompt increase forum activity [10].

Yang *et al.* [11] used social network techniques to investigate forum posts in a Coursera MOOC and concluded that high post duration (time between first and last posts) was related to a lower likelihood of drop out in any given week, whereas being a discussion initiator or making a high amount of posts was not. However, other studies [12,13] provide

contradictory evidence, as high levels of posting did appear to correlate with better course outcomes.

The difficulty of effective interaction in large forums has been noted by many authors [1,3,14]. In addition to the organisation of large numbers of posts, language is one obvious barrier. Despite the intention of forums making discussions open to all, Yang *et al.* [11] suggest that “cliquishness” may be essential in forming sub-groups for effective learning support.

Several studies have analysed participants’ behaviour in MOOC forums [14]. Forum posters tend to be young, well-educated professionals from the Western world and discussions occur between fairly random crowds rather than encouraging specific study groups [15]. Huang *et al.* [12] identify the “super-posters” who contribute heavily to the forum and conclude that such behaviour has a positive effect on forum health.

Some MOOCs have made forum participation a required part of the course. However, some learners may not be comfortable with this [10] and it may also lead to a large number of pointless posts. Even for active forum posters, perceived value of forum discussion has been observed to decrease as the MOOC progresses [16].

Despite widespread use of discussion forums in MOOCs and an increasing amount of literature, there is still a lack of clarity over what they are aiming to do and what they are achieving. Evaluation studies so far provide conflicting evidence on a number of aspects and further work is needed to determine best practice for their use and explore alternatives.

3. Computing for teachers forums

The Computing for teachers (CfT) MOOC was developed by the Department of Computer Science at Warwick University, UK. It aims to support teachers of computer science in UK schools where a new computing curriculum is being introduced creating a demand for more teachers of computing. CfT covered three areas: Python programming, computing concepts and teaching computing. The first run of the course in 2013-4 attracted over 500 participants, although some of those who registered did not participate in the course. Students were

offered a choice between two modes: peer-supported and tutor-supported. The former used “traditional” MOOC forums, mainly intended for students to discuss ideas and answer each other’s questions, but with occasional tutor intervention. The latter provided an additional forum which was monitored by tutors to provide support as needed, including rapid and (largely) definitive answers to questions. There was a (modest) charge for the tutor-supported mode which included further “extras” such as weekly online tutorial sessions and a human-marked final programming assignment with individual feedback. The two parallel modes of the CfT MOOC provide the opportunity for direct comparison of features across different modes. The sample discussion and graphs below give some initial insight into usage of the forums in the two modes.

3.1 Peer support discussion forums

These discussion forums were open to all CfT participants. They were unmoderated and covered general issues, programming, concepts and teaching respectively. Snapshots of three of the forums are given in Figs.1, 2 and 3 giving an indication of threads introduced. Aside from introductions and thanks to the course team, the main topics of discussion in the general forum concern programming and course-related issues such as reporting problems and suggesting additions. The dedicated programming forum had a much higher volume of posts than the concepts forum, with the teaching forum being very little used. In general, the number of responses was low, with some topics eliciting no replies. Although tutors provided a basic level of monitoring to answer specific questions, some posts, participants (as in Fig.4) expressed a feeling that lack of response hindered their studies. As reported in previous MOOCs, when the level of difficulty increases, too few participants feel confident enough to reply to the confused majority. The tutor’s post in this extract points to the further problem that participants can become very spread across the stages of the course. Particularly in a small course this can leave even fewer students in the vanguard who can contribute to discussion of the most recent stages.

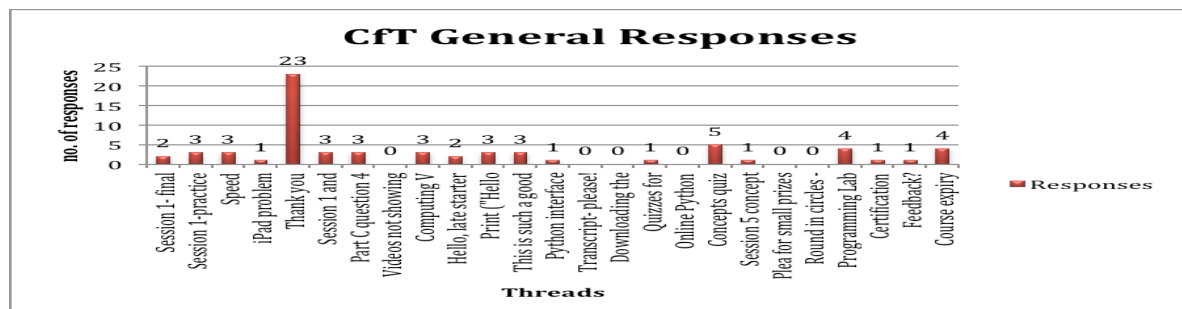


Fig.1 Snapshot of posts to the general peer-supported forum from the Computing for Teachers MOOC

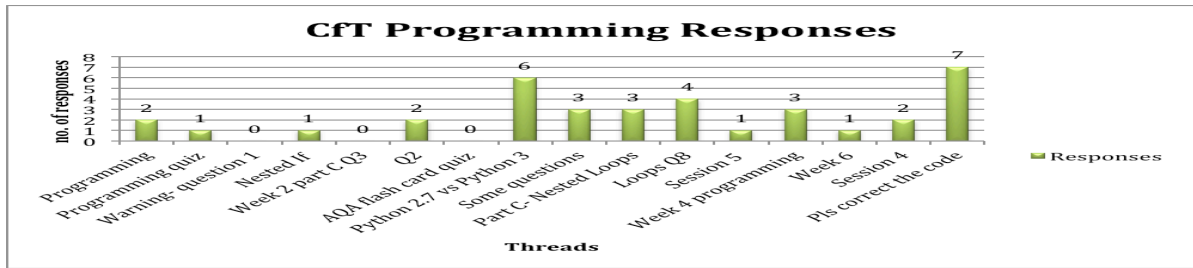


Fig.2 Snapshot of posts on Python programming forum

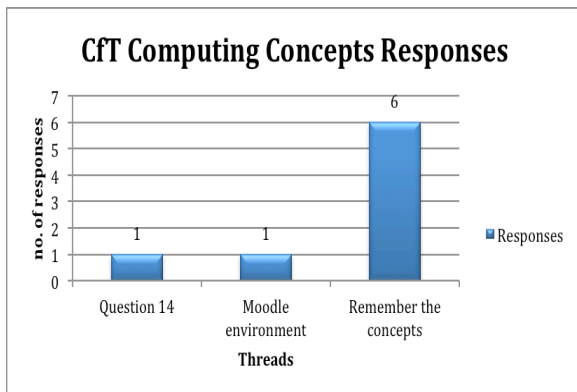


Fig.3 Snapshot of posts on computing concepts

Programming Lab
by [redacted] - Sunday, 23 February 2014, 12:04 PM

I have noticed that not many people are posting in the programming forum, is this because every one is doing really well and understands it or are people not doing the lab sections. I seemed to get on really well at the start, but just don't seem to get it now. I thought that the solutions would help, but with out a breakdown of what is happening, I don't always find them helpful. Would love to know how others are doing.

Re: Programming Lab
by [redacted] - Sunday, 23 February 2014, 3:01 PM

I too found the early programming exercises understandable but when I was stuck there was no response to messages posted to the forum and the solutions were supplied such a long time after the session that I have almost given up on them. I am hoping once this course is over to get travel organised and go through all the exercises again and try to get hints from the solutions. I know this is not what was intended but is the only way I can keep going!

Re: Programming Lab
by [redacted] - Thursday, 6 March 2014, 11:05 AM

While a lot of people are participating, the spread of activity is considerable. So while some people are at session 6, others are still working on session 3 and not able to offer help in the forums.

On the long delay before solutions - in general we release the lab solutions two weeks after the lab worksheets. I think we wanted to give you an opportunity to try the worksheets without the distraction of some solutions just a click away! We hear what you say about that sometimes being frustrating. It's certainly something we'll think about for next time.

Thanks,

Fig.4 Extract from peer-supported general forum

3.2 Tutor-monitored forum

This forum was accessible by students of the tutor-supported mode only. It was intended for providing rapid and informed responses by course tutors to targeted questions and problems raised by

participants. As can be seen by the extract shown in Fig. 5, a query (raised on a Saturday) was answered by a tutor in just over an hour. The student then shares an approach that they have been working on, but in general, the forum was used by students to obtain direct answers rather than to discuss different approaches or for collaborative problem solving. Fig.6 shows a snapshot of responses to threads in the tutor-supported forum. Here, posts are even less likely to start an on-going discussion, but generally end immediately with either a tutor's response or a corresponding "thank you" message.

Session 3 Lab B q 3
by [redacted] - Saturday, 25 January 2014, 12:47 PM

Could anyone tell me what I am doing wrong here, please? This code just prints out a list of numbers between 0 and 1000. How do I get the program to increment in 17s?

```
for x in range(0, 1001):print (x) = x + 17
```

Thanks

Re: Session 3 Lab B q 3
by [redacted] - Saturday, 25 January 2014, 2:00 PM

One way is using modulus to identify if divisible by 17 and then if it is divisible then print.

Re: Session 3 Lab B q 3
by [redacted] - Saturday, 25 January 2014, 2:44 PM

Thank you, [redacted] I will try to write what you suggest.

I discovered that this works

```
for x in range(0, 1001, 17): print (x)
```

Fig.5 Screenshot of tutor supported forum

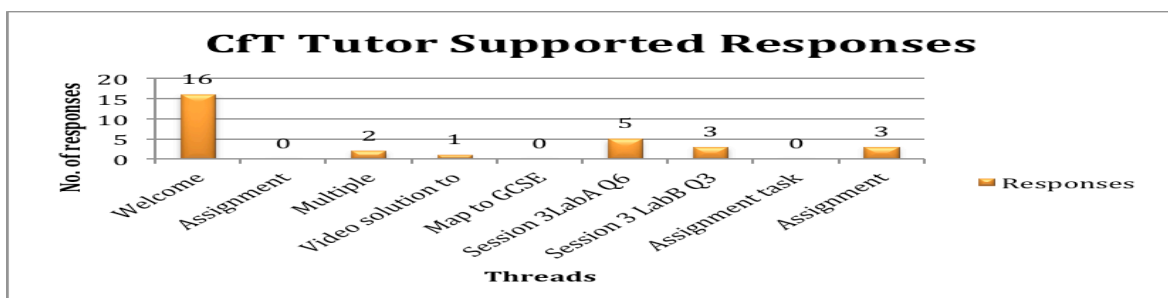


Fig.6 Snapshot of posts from tutor supported forum

4. Discussion

In both modes of delivery, levels of peer-to-peer discussion were low. Programming queries were the most common posts. This may be because programming was found to be the most challenging aspect, but it is also the case that the hands-on nature of the programming labs means that problem areas are exposed. In general, more active engagement strategies and the introduction of tasks related to forum posts are needed to encourage users both to initiate threads and to post replies to others.

By the nature of the tutor-supported forum it is not surprising that posts were in general expecting a specific response from an “expert” rather than a peer and, when an answer was received, there was no further discussion. The two modes here emphasise a general point about conflicting use of forums: on the one hand, forums may be thought to encourage peer discussion and to promote engagement and active learning; on the other hand (and particularly in “technical” subjects) learners may be hoping simply to get a rapid and trustworthy response to a specific question. The latter may be useful for learners to make progress, but tends to underline dependency on the tutor and discourage further discussion. There is an obvious difference here between a tutor-facilitated forum and a tutor-facilitated seminar. Despite the widespread use of forums there is still a lack of understanding of effective pedagogy. The rate for completion on the tutor-supported mode was higher than for those on the peer-supported mode. However, the additional facilities (both the forum and hand-outs with a tutor) were not highly used so the outcomes may be highly related to learners’ motivation and commitment as evidenced by the choice of a mode requiring payment.

In many MOOC platforms, the forum is seen as one of the major support mechanisms, but usage of forums is noted by many as being quite low in general and often confined to a minority of participants. Forum participation has also been investigated by some as a predictor of imminent drop-out [14]. However, even with more active engagement strategies to encourage participation, it seems that active forum behaviour appeals to some learners but not to others. There is evidence of “bad behaviour” on forums being an issue in a number of MOOCs but, even in well-behaved communities, there seems to be little evidence of support for students who start late or fall behind and it may even be the case that such students are discouraged by not being able to understand what is being discussed.

Further work is needed to discover students’ learning preferences and support different learning patterns. This applies both to the use of forums and to the wider issue of support. We intend to investigate pedagogy for effective use of MOOC forums and to explore aspects of adaptivity for MOOCs.

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