Discussion around individual open learner models

Alotaibi, Mohammad; Bull, Susan

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Discussion Around Individual Open Learner Models: Understanding or Copying?

Mohammad Alotaibi
Electronic, Electrical and Computer Engineering
University of Birmingham, UK
maa715@bham.ac.uk

Susan Bull
Electronic, Electrical and Computer Engineering
University of Birmingham, UK
s.bull@bham.ac.uk

Abstract— **In this paper we investigate whether learners at university level can appropriately collaborate with peers around individual Open Learner Models (OLM). We describe results from three groups of students who used Facebook alongside an independent OLM to discuss their individual OLM. The results suggest that students can collaborate appropriately when they discuss their learning on Facebook and in face-to-face settings, with the aim to understand.**

Keywords-Open Learner Model; Collaborative Learning; Online Social Networks

I. INTRODUCTION

Open Learner Models (OLM) are Learner Models (LM) externalized in an understandable way to learners and sometimes others who may benefit from viewing the LM [1]. OLM are presented in different formats, for example simple visualizations include skill meters or a ranked table representing the level of knowledge and misconceptions "Fig.1" [2]. Promoting interaction between learners is considered one of the reasons of using OLM [1]. Using individual OLMs that are available for peers to view is one of the approaches to support collaborative learning as work on using individual OLM suggests that it can support their collaboration in face-to-face (F2F) settings [2]. Other work allowed learners to view OLM alongside those of peers for comparison, and possibly communication and peer help [3]. We aim to extend discussion around OLM to an online environment using Facebook, to investigate the feasibility of facilitating such discussion when students are not together. Facebook provides several tools that can support collaborative learning activities such as groups and communications. Facebook is widely used in educational settings. Results suggest that using Facebook for learning can result in a high level of interaction among students as well as a high level of student satisfaction [4] and can enhance students' learning [5].

Figure 1. Two views in the OLMlets OLM

Because individual LM aim to model individual learners and contain information about individual knowledge and possibly difficulties, one could argue that using this approach could result in a less accurate LM, especially if one considers that students may exchange answers or solutions for the adaptive system's questions or tasks without really understanding them. In this paper we investigate whether students collaborate and discuss their knowledge appropriately when using Facebook with the OLMlets OLM. OLMlets is a web based independent OLM (IOLM) (i.e. it does not provide teaching to the learner, and requires learners themselves to identify suitable ways to improve their understanding) [2]. OLMlets models learners' level of skill or knowledge, and misconceptions. It uses learners' answers to multiple choice questions alongside a set of misconceptions that are pre-defined by the instructor, and a simple weighted algorithm to model the learner. OLMlets externalises the LM in a variety of formats "Fig.1".

II. USING FACEBOOK WITH OLM

Previous work has described using Facebook with OLM with a group of students with results suggesting that it can support collaboration and sociability [6]. We here extend this work considering three groups who used Facebook alongside OLMlets [2], with specific attention on *whether students really do collaborate, or whether they simply seek answers to OLMlets questions*. The latter could have negative implications for OLMs in adaptive teaching systems.

A. Participants, Materials and Methods

Students from three groups (N=30) used Facebook alongside OLMlets. All students were studying in the School of Electronic, Electrical and Computer Engineering at the University of Birmingham, UK taking undergraduate modules "Table 1". Each group was asked to join a separate secret Facebook group page which was dedicated to the class, to allow them to optionally discuss their learning with peers and with the instructor. Students' participation in Facebook and their use of OLMlets was not assessed. Students were introduced to OLMlets in a lab session, and then used it as they wished in their own time.

Table I. Participants and Number of Posts in Each Group

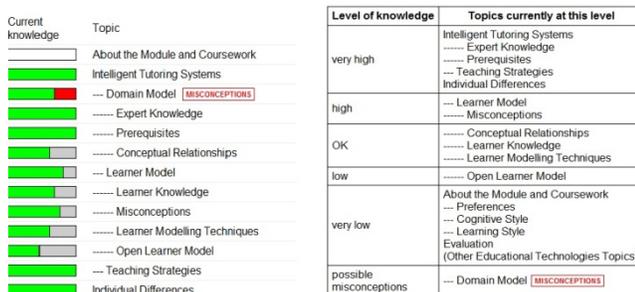| Group	Module	N	Student Posts
A	Adaptive Learning Environments	15	82
B	Adaptive Learning Environments	8	64
C	Personalization and Adaptive Systems	7	36

Students were not instructed to work in collaboration with peers. In our analysis of the Facebook interaction we combine students' posts from all the groups as there was little to distinguish them. Their F2F interaction when they were using OLMlets in lab sessions was observed.

B. Results

Students' interaction in the Facebook groups resulted in 182 student posts. The number of posts containing statements related to students' learning such as questions and answers about questions in OLMlets, or explaining and negotiating concepts related to their learning, was 89. The following example "Fig. 2" shows a discussion between 3 students on the Facebook group wall.

S1: in OLMlets, there is a question which is If a person answers question incorrectly they will probably have misconception why is this statement is false??? Confused a bit.
S2: it could be because they don['t] know the answer so that is not a misconception
S3: Remember OLMlets doesn't model wrong answers. It models incorrect beliefs which are misconceptions. So getting an answer wrong once doesn't mean you don't understand the topic. It might just mean you are having difficulty with that particular answer!
S1: but **S2** it says "probably" which i understand it could be a misconception or lack of knowledge.
S2: Dont worry about having the right answers on olmlets. Worry about getting the right understanding for your test.
S1: yh it says probably so it could be the incorrect answer

Figure 2. Example of students' interaction in Facebook

By examining the students' posts, we find that the typical nature of the posts that when students were looking for an answer to a question, they usually request explanation. We also find when students attempted to answer peer questions they attempted to explain their answers.

Our observation of students' F2F discussion during lab sessions suggests that, in very few cases when students used OLMlets, they were only interested in finding the right answer for the multiple choice question. However, in most cases, students asked for further explanation of the answer that was provided to them by their peers "Fig.3".

S1: Cats could be part of which of the following?
S2: the answer is Learner Model.
S3: it can be part of the domain and learner model
S1: why?
S4: If the learner knows about cats then it can be part of the learner model. If the system is teaching about cats then it can be part of the domain model

Figure 3. Example of students' face-to-face discussion

C. Discussion

We have investigated the nature of discussion when Facebook is used with IOLM and we observed the F2F discussion that occurred between students. In Our observation of the F2F discussion in the lab session, students in a *few* cases attempted to ask peers for the right answer without asking for an explanation or any kind of clarification. This approach, if it happens often, could decrease the accuracy of the LM. Therefore, the resulting model would not really represent the learner's knowledge

level or misconceptions. The possible effects of this may not be crucial with IOLM because, with IOLM, students would know if they had input answers without understanding and they know that IOLM aims to identify their level of knowledge and misconceptions for their OLM use. Furthermore, IOLM does not contain a teaching model [2]. However, if students copy peers' answers when using a system that contains a teaching model such as an Intelligent Tutoring System (ITS), students could receive inappropriate personalised guidance or teaching.

The analyses of the students' posts suggest that students used the Facebook group to discuss their learning. Even though some of the posts were open questions that may or may not come as a result of their use of OLMlets, when students posted questions about the OLMlets OLM "Fig. 2" they did not simply ask for the direct answer. Instead, they engaged in a discussion about the question. In cases where students attempted to answer peer questions they also provided explanation and justification for their answers. Similarly, when we observed their use of OLMlets in lab sessions students usually engaged in a F2F discussion about some of the OLMlets questions "Fig. 3". By engaging in this discussion (on Facebook or F2F) students can reflect on their learning and understand the concepts better. Such discussions are not only important to student learning, but also to an adaptive system, because the outcome of such discussion could result in students enhancing their understanding and, therefore, inputting responses that represent their actual understanding about the questions or problems that they discuss. Therefore, if OLM is used in an ITS with adaptive teaching based on individual LM, collaborative interaction can still be beneficial to leaners at university level: Our results suggest that students at university level can collaborate with peers around individual OLM appropriately.

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