
Oppia: A Community of Peer Learners to Make Conversational Learning Experiences

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Abstract

We present Oppia, an open-source, interactive online learning site that aims to create a community of everyday learners by allowing users to both teach and learn from each other. The Internet presents great opportunity for more accessible and collaborative learning. With online learning there is more potential in harnessing collective intelligence to support peers in sharing knowledge with each other and collaborating on learning experiences. Oppia contributes to the CSCW community by tapping into this potential and shifting the focus of online education towards greater peer-produced educational content and peer interaction.

Author Keywords

online education; peer learning; collective intelligence

ACM Classification Keywords

H.5.m. Information Interfaces and presentation (e.g., HCI)

Introduction

Online learning has grown in size and relevance with the popularity of massive open online courses (MOOCs). MOOCs have brought to light both the potential opportunities and challenges that such large-

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scale open education presents. Thus, questions of best pedagogical practices in these online learning environments need to be addressed.

According to Sharples [5], effective learning strategies follow principles of Conversation Theory, which describes learning as a conversation that requires reflection and externalization of understanding with another person or system. These principles follow the three Cs of effective learning: construction, conversation, and control, all of which aid in the integration of new information with existing knowledge and encourage the active pursuance of knowledge rather than passive consumption.

Within the context of online learning, peer learning serves to bring conversational learning to scale. Peer learning, which can involve the sharing of knowledge of collaboration on a learning experience, has been shown to improve learning through articulation of knowledge, critical reflection, and discussion of different perspectives and ideas [3]. Massive open online courses (MOOCs) have begun to harness peer learning with discussion forums and software applications such as PeerStudio for peer grading and feedback [1] and TalkAbout for bringing together small groups of peers for meaningful discussion [2]. Peer learning ties strongly with collective intelligence, the shared intelligence of a group that emerges through collaboration or competition of individuals. By bringing together a large group of people through a common system such as discussion forums, social learning systems encourage active participation and collaboration, creating more learner-centered frameworks [4]. Challenging areas in the realm of crowdsourcing and peer learning in online education

remain the creation and curation of content, personalization and engagement, and providing rich feedback [6].

We present Oppia, an interactive online learning site that aims to address these challenge areas of personalized online education. Oppia leverages collective intelligence by allowing users to both create educational content and learn from each other. In this demonstration, we will show how interactive features can be embedded within Oppia's content modules to simulate tutor-student dialogue and provide instantaneous and personalized feedback.



Figure 1: The Oppia logo

Oppia Explorations

Oppia users can act both as "tutors" and "learners" by creating and learning from short modules of educational content called "explorations." Tutors customize the content and structure of explorations via the exploration editor. Explorations are made up of "cards," which consist of some content (where the tutor 'talks' to the student) and an interaction (where the student is invited to demonstrate their knowledge by solving a task).

This demonstration will cover the construction of an Oppia exploration to show the key components that

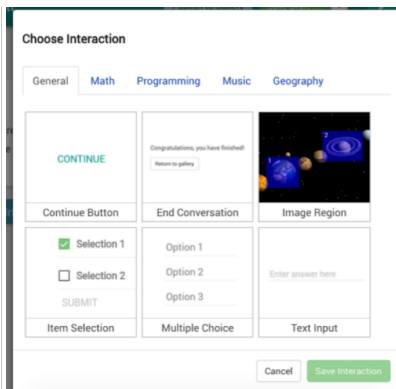


Figure 2: Tutors can customize the type of interaction to give the learner

contribute to creating dynamic peer-produced learning experiences.

- **Question.** The exploration editor allows and encourages tutors to add interactions that question and challenge the learner's understanding of the content (Figure 2). These interactions facilitate active engagement with the content and add to the conversational component of Oppia.

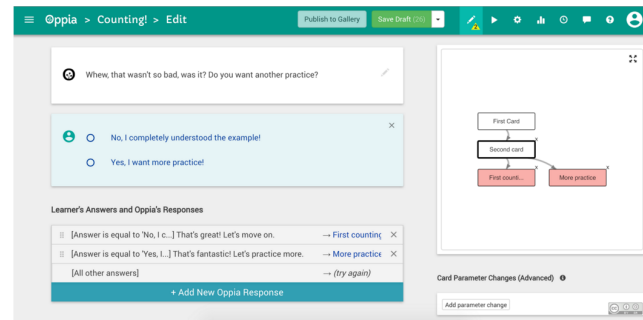


Figure 3: The exploration editor in Oppia follows a hierarchical structure of Oppia explorations. Tutors are able to create different branches based on a learner's response to a question.

- **Conversation.** Based on the learner's response, the tutor can give specific feedback that addresses particular misconceptions or draws the student's attention to possible omissions. Different answers may elicit different types of feedback, and in some cases, the tutor can create several levels of simpler versions of questions in order to help scaffold a

learner's understanding (Figure 5). These conversational elements add to creating a more individualized learning experience for learners based on their own understanding of the content.

As explorations are entirely user-created, the community of Oppia learners can provide input to improve explorations. Learners can leave comments on individual cards within explorations. At the end of the exploration, learners can also give ratings to convey their level of satisfaction with the learning experience (Figure 4). From this feedback, tutors can update their explorations to improve them for future learners. These collaborative input systems from the Oppia community help users continually update and enhance explorations on the site.

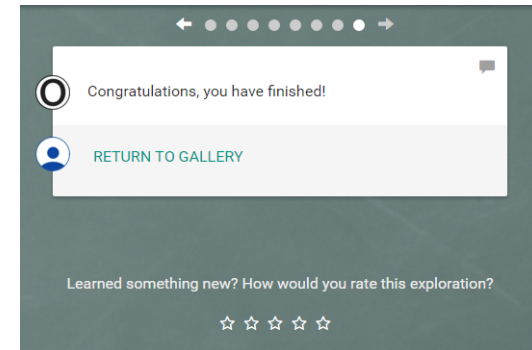


Figure 4: Learners can leave comments and ratings to help tutors improve their explorations.

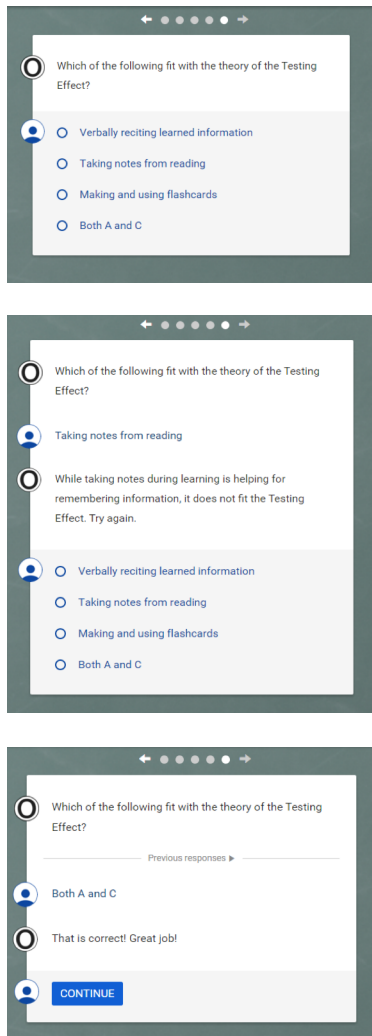


Figure 5: An example of a question and conversation, giving feedback based on the learner's response

Future Directions

As teaching is an inherently difficult task, we are researching ways to provide greater support and structure for tutors to create better educational content based on evidence from learning sciences and human-computer interaction research. Future work will also look at what types of interactions are most appropriate for explorations and how best to scaffold learning within explorations for learners who are struggling. As Oppia is a peer learning platform, we will also be continuing to explore how to implement more collaborative features to allow peers to interact with each other in real-time.

Discussion

Large-scale MOOCs can often feel impersonal due to their sheer size. Peer learning provides some alleviation to this issue by bringing dialogue and interaction to a smaller scale. Peer interaction online often occurs in discussion forums or chat rooms. But these platforms rely on timely response and reciprocation in order to be effective. Oppia serves as a platform for peers to create dynamic, conversational educational content that is interactive and personalized even in asynchronous contexts. Relevant to the goals of CSCW, Oppia creates a community of learners who work together to produce better learning experiences on the web. Oppia allows peers to share snippets of knowledge through explorations, bringing people together through learning.

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