Adaptive Learning Meets Crowdsourcing: Introducing a Tool for Fostering Personalised and Higher Order Learning

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Abstract
This 1.5 hour demonstration presents RiPPLE, which is an open and free-to-use adaptive learning system. RiPPLE recommends personalised learning activities to students based on their knowledge state from a pool of crowdsourced learning activities that are generated by educators and the students themselves. RiPPLE integrates insights from crowdsourcing, learning sciences and adaptive learning, aiming to narrow the gap between these large bodies of research, while providing a practical platform-based implementation that instructors can easily use in their courses. The aim of this demonstration is to provide a theoretical justification coupled with a hands-on illustration of the RiPPLE system to help participants make an informed decision on whether or not they would like to adopt RiPPLE.

Keywords
Adaptive learning, Crowdsourcing in Education,

1. Rationale
A growing body of knowledge provides evidence about the effectiveness of Adaptive Learning Systems (ALSs) in supporting student learning (VanLehn, 2011; Ma, Adesope, Nesbit, & Liu, 2014). The most successful adaptive platforms tend to focus on a specific domain and also require a tremendous investment of time by experts during the development of curriculum content, which makes it difficult to scale these approaches across many domains. As a viable alternative, we see great promise in trying to leverage ideas from crowdsourcing and learning science to create adaptive systems where students themselves could generate content that can be adaptively served. The benefits of engaging students in content creation are twofold. The first benefit is in transforming the role of students from passive recipients of content to active creators of course material. Previous studies have reported that placing the responsibility of content creation in the hands of students reinforces and deepens their understanding of the course content (Draper, 2009), highlights the significance of representing their work in a clear and logical fashion, encourages reflection on the course objectives (Purchase, Hamer, Denny, & Luxton-Reilly, 2010), and enhances their conceptual understanding (Bates, Galloway, & McBride, 2012). The second benefit comes from harnessing the creativity of students themselves towards the development of large repositories of learning resources. Previous studies have demonstrated that students indeed have the capacity to create high-quality learning resources that meet rigorous judgemental and statistical criteria (Walsh, Harris, Denny, & Smith, 2018).

This demonstration presents RiPPLE, which is a crowdsourced adaptive learning system. To date, over 3000 registered users from 15 courses have used RiPPLE to create over 7,000 learning resources and attempt or review over 200,000 learning resources. Many of the main features including creation of a RiPPLE offering, creation and moderation of content, visualisation of learner models, recommendation of learning resources, assessing student profiles and course reports are demonstrated using hands-on activities. Prototypes of RiPPLE demonstrating the student view and the instructor view are available here. The platform provides easily accessible data to support research on a number of topics that are of interest to the LA community, including empirical evaluation of the effect-size of engagement with (1) higher-order learning activities such as evaluative judgement (2) open learner models and (3) recommender systems on learning. An evaluation of the platform has been conducted based on a pilot in an introductory course with 486 students at The University of Queensland. Initial results suggest that the use of the

1 ripplelearning.org
RiPPE platform led to measurable learning gains and that students perceived the platform as beneficially supporting their learning.

Figure 1 illustrates one of the main pages of RiPPE.

**Figure 1.** One of the main pages of RiPPE

### 2. Aim and Format

The aim of this demonstration is to provide a theoretical justification coupled with a hands-on illustration of the RiPPE system to help participants make an informed decision on whether or not they would like to adopt RiPPE. The demonstration will have three parts that are **half an hour** each:

1. The first part will provide a rationale for developing RiPPE (a crowdsourced adaptive learning system) and the gap it is trying to fill with reference to the related literature.
2. The second part will introduce the system through a series of hands-on demonstrations, taking the participants through the main features of RiPPE. This part also includes discussions about the lessons learned and best practices for integrating RiPPE into a course.
3. The third section invites an open discussion around the benefits and challenges of using RiPPE (or more broadly crowdsourcing and adaptive learning) in higher education.

Technical support for the adoption of the system can be provided after the session for those that are interested in piloting RiPPE.

### References


