Mapping student online actions
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1. Keeping track of student learning

In this study, we investigate how students in a physics course on neutron scattering use a web-based wiki-formatted textbook while they are in class [2].

Inspired by [1], we use server log-files to track and construct networks of user sessions on a web-site for learning.

The learning situation is represented as resulting output and networks. As part of class, students work with online problems that contain hints and solutions that students can open and close as they wish.

As part of the course, students spend time in class solving online problems with hints. Student online actions during these web sessions are recorded with web-analytics software OWA (http://www.openwebanalytics.com/).

Specifically, we record ip-adresses, where, when, and on what they click on the web-site pages, and the unique id for each session. A low target entropy network likely signifies more student active engagement (rather than passively reading the a page). We want to investigate different online strategies and link these to student learning outcomes. We are in the process of identifying strategies.

2. Student online actions while learning as networks

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We use networks and network measures to characterize student sessions as these are logged by the server. For example, target entropy [5] is a measure of how predictable student interactions are.

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3. Comparison between students from different years

We compare sessions recorded during the weeks in which students engage with online material.

We only consider sessions with duration d>5 min.

Using non-parametric tests, we find the target entropy for 2014 is significantly higher than for 2012 and for 2013 (p<0.01).

The plots show that students focus their engagement early in the course. This is also when they are given time during class to solve these problems.

Selected References