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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.

Network analysis have previously been employed to online forum discussions [3,4]. We focus on behaviours while solving problems that are related to learning.

We have constructed so-called wiki-problems. In solving these problems, we aim for students to make use of hints, solutions and other parts of the web-site.

We ask the question: “What patterns of engagement can we discern from network representations of student interactions?”

2. Student online actions while learning as networks
The learning situation
As part of class, students work with online problems that contain hints and solutions that students can open and close as they wish.

We want to investigate different online strategies and link these to student behaviours while solving problems.

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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Using educational research to help us interpret the results [3,4], we argue that a high a 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.

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