



University of
Pittsburgh

School of Computing
and Information

Dissertation Defense
Doctor of Philosophy in Information Science

“Exploring the Effects of Learner-Controlled Social Comparison in Online Educational Systems” by Kamil Akhuseyinoglu

Date: September 2, 2025

Time: 11:00 a.m. – 2:00 p.m.

Place: Room 502, Information Sciences Building, 135 N.
Bellefield Ave, Pittsburgh PA 15260

Committee:

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Abstract:

Students frequently encounter motivational challenges in online learning, prompting the investigation of ways to support self-regulated learning effectively. One promising approach integrates social comparison information, showing students data about peers' practice and performance, into student-facing learning analytics dashboards (LADs) and open learner models (OLMs). Prior studies on such systems generally visualize aggregated practice and performance metrics of the entire class through one-size-fits-all presentations, which are effective in boosting motivation and achievement. However, these designs can provoke negative effects, especially when upward comparison (comparing oneself with higher-performing peers) results in negative self-evaluation through contrast rather than positive motivation outcomes from assimilation.

My thesis examines the design and integration of learner-controlled social comparison mechanisms within an online programming practice environment, explicitly aimed at amplifying motivational benefits and minimizing adverse effects of social comparison. Through exploratory classroom experiments, I initially examined how students utilized two types of learner-controlled social comparison features, how this affected their online behavior, and whether this resulted in any negative impacts on learning outcomes and motivation. Building upon these findings, a subsequent randomized classroom experiment was conducted to understand the effects of learner-controlled social comparison on learner behavior compared to a traditional social comparison approach. Additional experimental evaluations were also performed to examine how historical peer data influenced students' confidence and self-evaluation bias. Further, using user-centered design approaches, such as semi-structured interviews and storyboarding studies, students' preferences and concerns towards social comparison features were collected and qualitatively analyzed. Guided by these insights, additional classroom experiments were conducted to understand how the inclusion of a practice goal-setting feature, along with the learner-controlled social comparison features, influenced students' engagement and behavior.

Synthesizing qualitative and quantitative analyses across interconnected studies, this research contributes to the understanding of social comparison dynamics in online educational contexts with a particular focus on learner control and offers guidance for scaffolding self-regulated learning.



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