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Using latent transition analysis to identify effects of an intelligent tutoring system on reading comprehension of seventh-grade students

Xuejun Ryan Ji[1] · Andrea Beerwinkle[2] · Kausalai (Kay) Wijekumar[2] · Puiwa Lei[3] · R. Malatesha Joshi[2] · Shuai Zhang[2]

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Abstract

Latent transition analysis (LTA) was conducted on data from a recent cluster randomized controlled study of 1808 seventh-grade students' use of a web-based intelligent tutoring system (ITSS). This analysis goes beyond traditional variable-centered methods to focus on profiles of learners and changes in reading class membership between pre- and post-tests for students with and without receiving ITSS intervention. A four-class model was obtained, consisting of poor readers (class 1), delayed readers (class 2), proficient readers (class 3), and readers with specific deficits in problem and solution (class 4). Analysis showed that students receiving the ITSS intervention were more likely than students without the intervention to transition into the proficient class regardless of their initial reading performance profiles. However, the odds ratio of transitioning into the proficient class (as opposed to staying in the same class) in the ITSS condition, compared to the control, was the highest (4.29) for initial readers with deficits in problem and solution, followed by initial poor readers (1.66) and initial delayed readers (1.50). Findings indicated that students in the ITSS condition had larger reading improvement than students in the control condition, particularly for readers with initial deficits in problem and solution.

Keywords Text structure strategy · Latent transition analysis · Reading comprehension

✉ Xuejun Ryan Ji
x.ryan.ji@ubc.ca

Extended author information available on the last page of the article