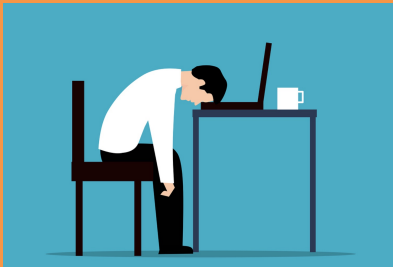


# Modeling Frustration Trajectories and Problem-Solving Behaviors in Adaptive Learning Environments for Introductory Computer Science

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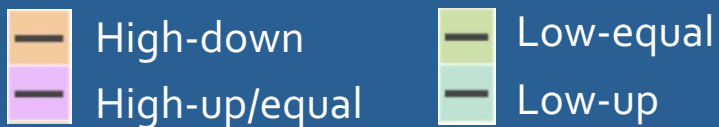
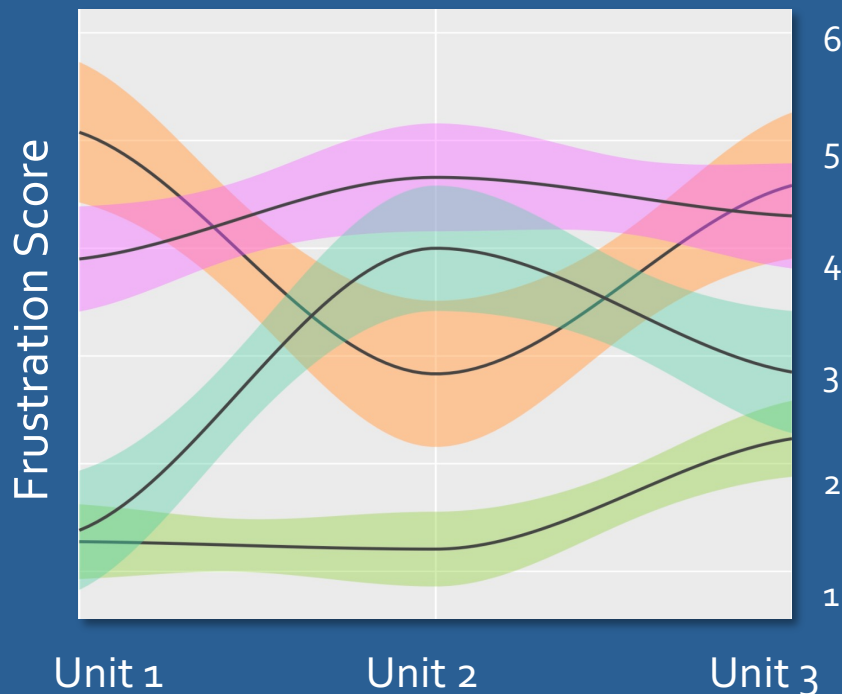
- Prolonged, Repeated Frustration can lead to boredom, and eventual attrition (D'Mello & Graesser, 2012; Dillon et al., 2016)
- RQ1: What are common trajectories of frustration?
- RQ2: Do students with different frustration trajectories display different problem-solving behaviors?

A screenshot of the PRIME programming environment. The interface shows a navigation bar at the top with 'PRIME', 'Previous Activity', 'Next Activity', and 'Surveys'. Below this, there are 'Save', 'Load', and 'Copy Previous Activity' buttons. The main content area is titled 'Activity 3.5: repeat while Loop'. It contains instructional text about programming loops and a 'do' block with a 'repeat while' loop. The 'do' block contains a 'prompt for value with enter the grade' block and a 'store value in var' block. The 'repeat while' block has 'var &lt;= 0' and 'var &gt;= 100' as conditions. On the right side, there is a 'HINT' section with a 'Get Hint' button and an 'OUTPUT' section with a 'Run' button. The bottom left shows a sidebar with categories like Text, Math, Loops, Logic, Variables, and Functions.

## Study

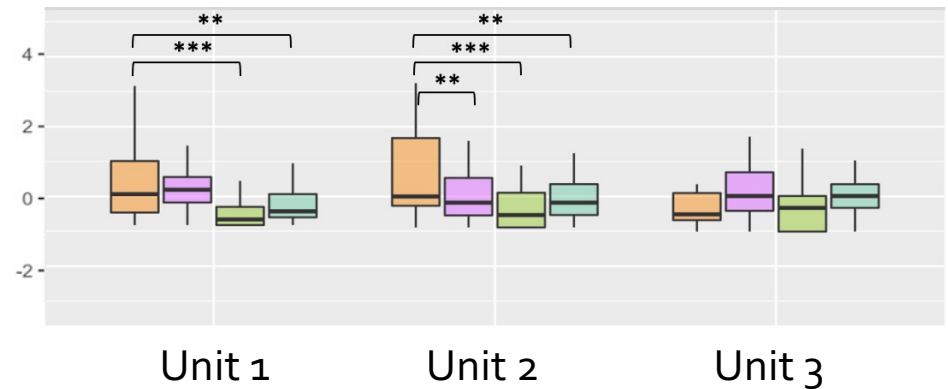
- 86 undergraduate students
- Block-based programming environment PRIME
- Three instructional Units (20 programming activities)
- Between-unit self-reported frustration

# Frustration Trajectories



For more detail, visit [www.txiaoyi.com](http://www.txiaoyi.com)

Help-seeking behaviors of learners with different frustration trajectories



- **Consistently frustrated** learners show signs of **disengagement**.
- Students with high initial frustration and report lower frustration later **have sought more help**.



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