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Bot as Study Peers: State of Flow, Balanced Task Difficulty, and Adaptive learning.

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TREO Talk Paper

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Abstract

Due to resource constraints, the traditional education approach suffers from the limited interactions between students and instructors. Adaptive learning, with the assistance of an AI bot, can provide customized educational content to students based on their individual learning capabilities. However, multiple design choices exist in building such an adaptive bot and it is unclear how users would react to them.

Drawing insights from the theory of flow (Webster et al. 1993; Jeanne and Csikszentmihalyi 2009; Csikszentmihalyi and Larson 2014), the aim of this research project is to explore the viability of using AI bots for adaptive learning in the contexts of novice data analysts learning programming tools (e.g., Python, R). The state of flow is an optimal mental state of experience when one is actively engaged and completely immersed in an activity. The flow state has been widely studied in settings including education, sports, and games. To keep the learner experiencing a state of flow during the learning, the key idea behind this project is that the use of a bot can take away certain challenges in the tasks to balance the trade-off between the skills of the learner and the difficulty of the tasks. For example, memorizing the programming language syntax and designing a program to solve a certain task are ranked as two top difficulties perceived by novice programmers (Lahtinen et al. 2005). Students usually refer to their class notes or search for documentation for syntax help. However, that interruption breaks their flow of thinking in developing the solutions and finding bugs. In contrast, a bot can be designed to take away the challenges of either memorizing the syntax or thinking about the next steps. With a simulated online learning platform where a bot provides hints to learners, the project will examine the performance implications of human-bot task configurations in adaptive learning. The project will contribute to the literature of adaptive learning and IS education on programming for data science and business analytics.

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