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Supporting Success in Physics Using Problem-Solving Prompts and Retrieval Practice

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There has been noted concern regarding the retention, academic success, and motivation of students in STEM courses, especially physics. Additionally, problem solving is a highly valued 21st Century workforce skill in Canada (Hutchison, 2022) that recent graduates seem to lack (Cavanagh, Kay, Klein, & Meisinger, 2006; Deloitte & The Manufacturing Institute, 2011; Binkley et al., 2012; Finegold & Notabartolo, 2010). The aim of our project is to address these concerns by implementing novel cognitive strategies –retrieval practice –in physics instruction and assess its impact on students'academic performance and attitudes of physics learning. Our objectives are: 1) Develop problem solving materials based on retrieval practice. 2) Implement these materials in a first year physics course and prepare teaching assistants to facilitate learning using these materials. 3) Assess the impact of these interventions on success in the course as well as attitudes and approaches to problem solving. Here, we will describe the development of course materials promoting retrieval practice, our implementation strategies, and present student success findings from a first year physics course.

Keyword-1

Problem Solving

Keyword-2

Cognitive Stategies

Keyword-3

Retrieval Practice

Authors: REBELLO, Carina (Toronto Metropolitan University); MEGALLY, Mina (Toronto Metropolitan University)

Presenter: REBELLO, Carina (Toronto Metropolitan University)

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