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Strengthening Math Foundations in PHYS 100: A Targeted Workshop Approach

Monday 9 June 2025 15:30 (15 minutes)

At Simon Fraser University, PHYS 100 is a large introductory physics course designed for students who have not taken Physics 12 (or its equivalent). Since Physics 12 is a prerequisite for the university-level physics courses required in many physical and life sciences programs, PHYS 100 serves as a crucial stepping stone for some students pursuing these fields. However, many students entering PHYS 100 lack the essential mathematical skills required for problem-solving, creating a significant barrier to success.

A pre-term math boot camp could help bridge this gap, but logistical and financial constraints make this type of early intervention challenging. To address this issue, we implemented a 20-question multiple-choice diagnostic test at the beginning of the term to assess students' proficiency in four key areas of high school math: proportional reasoning, trigonometry, graphing, and exponents/logarithms. Students who answered fewer than 3 out of 5 questions correctly on any topic were given an incentive to attend targeted workshops addressing their specific skill gaps.

Each 90-minute workshop consisted of a mini-lecture followed by an active problem-solving session, where students worked at whiteboards in randomly assigned groups of three. The workshops were offered twice—once in the first four weeks and again later in the term. We analyze differences in attendance based on the timing within the term and the workshop topics.

To evaluate the impact of these workshops, we compare the final average grades of students who attended versus those who did not, taking their diagnostic test scores into account. I will discuss the effectiveness of targeted math support in enhancing physics problem-solving abilities. Beyond addressing immediate skill gaps, this approach may also encourage students to reflect on their prior knowledge and identify areas for improvement—an essential aspect of learning in physics and beyond.

Keyword-1

Early Intervention

Keyword-2

Math Skills

Keyword-3

Thinking Classroom

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