

Speaker:

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Position: Mathematics Tutor

Title: Questions not Answers

Intended Audience: Post-Secondary

Type of Presentation

Preferred: Short Presentation (20 minutes)

Language(s) of

Presentation: English

Description:

In February 2013, I joined the faculty at Quest University Canada, a new liberal arts institution in Squamish, British Columbia.

During my short time as a "mathematics tutor" at Quest, I've discovered that post-secondary math education can be so much more effective than traditional approaches, both in terms of its curriculum and its pedagogy.

If my vignette is accepted for the 2014 CMEF, I would give a short 10-minute presentation on two aspects of what makes Quest unique: the math foundation course, and the "block" format. Then I would conclude by posing two questions (see below) to elicit further discussion and dialogue.

Let me briefly describe the two aspects of my proposed talk, as well as my two questions; the full details are provided in the attached vignette.

Every Quest student is required to take a math class within their first two years of study. Thus, a natural question is what type of math class should be offered. Should this math class be a broad survey course, or perhaps a "service" course such as Calculus or Linear Algebra to prepare students for future math courses, as well as courses in biology, economics, and chemistry?

Quest's answer is neither. The goal of the math foundation course is to introduce students to the ways in which a mathematician asks and answers questions about the world. As a result, Quest offers introductory foundation courses such as Spherical Trigonometry, Visual Mathematics, Symmetry, and Mathematical Problem-Solving – while leaving traditional "introductory" courses such as Calculus and Linear Algebra until third year!

This radical approach naturally begs the following discussion question:

*If you could design an introductory undergraduate mathematics course, completely from scratch, what would you teach and why? Would you opt for a broad survey course in mathematics, a traditional course such as Calculus or Linear Algebra, or something entirely different? Why?*

Each course at Quest is taught using the “block” format, where students take a single course each month, rather than juggling four or five courses each semester. During an 18-day block, a student has three hours of class each day, with five hours of homework each night.

This focused approach forces students to concentrate on mathematics, a subject that for many evokes feelings of anxiety and fear. The students can’t procrastinate by working on “other” courses, and so they can confront these feelings of anxiety head-on; indeed, they have to.

In addition to the intensity of student engagement, the depth of student retention is phenomenal due to focused immersion in a single subject. Of course, there is much debate on whether such a format is beneficial for a student learning mathematics. This motivates the second discussion question:

*How should a student learn mathematics at the undergraduate level? In your opinion, is an intense focused engagement with the subject positive or negative? Does the Quest “block” format of having students spend their entire month learning mathematics hinder or enhance one’s ability to retain (and truly learn) the subject?*