



**PROMOTING STUDENT  
MOTIVATION WITH  
INQUIRY-BASED LEARNING  
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Elizabeth Shire and Ryan Savitz

Contact Ryan at [savitzr@neumann.edu](mailto:savitzr@neumann.edu)

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# ABSTRACT

This study takes an overview of the literature on the motivation of secondary school mathematics students. In particular, the relationships between the use of inquiry-based learning techniques and student motivation are examined. We also examine the student-teacher dynamic as it relates to the motivation of mathematics students. Students' expectations of teachers and teachers' expectation of students are compared and contrasted.

# MATH PHOBIA AND STUDENT MOTIVATION

Math phobia- inconceivable dread of mathematics that can interfere with manipulating numbers and solving mathematical problems within a variety of everyday life and academic situations

Fixed mindset- when students do not think they have the capability of learning math

One study conducted on a random sample of students found that

88% hate math

58% fear mathematics

75% have a belief that mathematics is a difficult subject

Despite this data, when surveyed 82% of the students identified a willingness to learn math.

# THE ART OF INQUIRY



Inquiry is a term used both within education and in daily life to refer to seeking explanations or information by asking questions.

Specifically, within education, there is a high potential for inquiry to be applied in classrooms in a wide array of subjects domains.

## WHAT IS INQUIRY-BASED LEARNING?

Inquiry-based learning (IBL), is a form of active learning that comes in many shapes and sizes.

The two common principles that act as the “twin pillars” of IBL are **deep engagement in rich mathematics** and **opportunities for collaboration**.



## TEACHER VS STUDENT PERSPECTIVES/NEEDS

- School structures limit teachers ability to properly enforce students prior knowledge.
  - Teachers aim to cultivate an environment of creativity in their classrooms.
  - Classroom learning is more productive when students are active in their learning.
- Lack of reinforced prior knowledge leaves students with feelings of misunderstanding.
  - Students yearn for choice and freedom in their own education.
  - A classroom should be a space where students can actively express their concerns.

## THE EVIDENCE

The range of benefits of IBL include:

- knowledge and skills development
- increased intrinsic motivation development of expertise
- notable self efficacy
- task commitment
- positive attitudes about learning
- perceived competence/expertise
- greater creativity

Beyond examining grades and exam scores, scientists have found that IBL affords students choice and autonomy, precipitating increased academic motivation and, not surprisingly, academic achievement. Moreover, IBL allows opportunity for students to experiment, fail, return to researching, revise thinking, and try again.

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