

Inquiry-Based Education in Mathematics: Models, Methods, & Effectiveness for Higher Education

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What is IBL?

The Big Picture

If we really want students to be independent, inquisitive, & persistent, then we need to provide them with the means to acquire these skills.

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 - IBL is a teaching method that engages students in sense-making activities.
 - Students are given tasks requiring them to solve problems, conjecture, experiment, explore, create, & communicate.
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- Example: Modified Moore Method, after R.L. Moore.
- Students should as much as possible be responsible for:
 - guiding the acquisition of knowledge and,
 - validating the ideas presented. (Students should not be looking to the instructor as the sole authority.)

Guiding Principle of IBL

Continually ask yourself the following question:

Where do I draw the line between content I must impart to my students versus content they can produce independently?

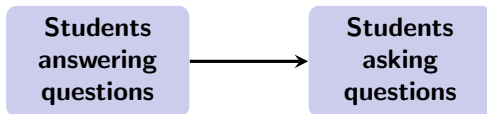
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Our Main Objective

How do we get here?



Two Typical Approaches/Modes to IBL

1. Student presentations.
2. Small group work.

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Important Role Changes

- Instructor becomes a mentor, cheerleader, and coach. Focus on teaching process.
- Student becomes the mathematician.

IBL vs Presentations/Group Work

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- What matters is what is happening during these activities.

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IBL vs Inverted/Flipped Pedagogy

- IBL/Moore Method is an instructional practice.
- The flipped classroom is:
 - A platform, not an instructional practice.
 - Centered around the idea of removing some/all of the information transfer tasks outside of class & replacing the time that's freed up with whatever instructor feels is appropriate.
- IBL and *flipped learning* (see R. Talbert's talk) are compatible.

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- Who critiques the mathematics once presented?
- Who decides what is correct mathematics?
- Who asks the questions that drive further work?