

Inquiry Brief 4: Variations in Classroom Practice among IBL Courses

First Findings from Observations of Classroom Activity, Leadership, and Questioning Behaviors

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Aims of the Study

This study addresses our research question about what teaching and learning practices characterize courses designated IBL. We aim to describe the common characteristics, and the variation in them, that make these courses come under a common label.

Study Design

The data presented here is based on 125 total hours of observation of 20 different class sections at three campuses during Fall and Winter of 2008. 14 of the classes observed were IBL and 6 were a comparative non-IBL group. Classes included introductory proof courses, advanced majors courses, and courses for pre-service teachers. Observers systematically recorded data on teacher and student classroom behavior, including activities performed, participation and leadership, questioning behavior, student demographics, and overall classroom atmosphere.

Findings

A number of factors influence IBL classroom practice

- **Student Audience.** There are visible differences in classroom leadership, usage of class time, and questioning behaviors observed in IBL classes targeted to introductory or advanced mathematics students, or pre-service teachers (Table 4-1).

Table 4-1 – Selected Indicators of Classroom Character by Student Audience

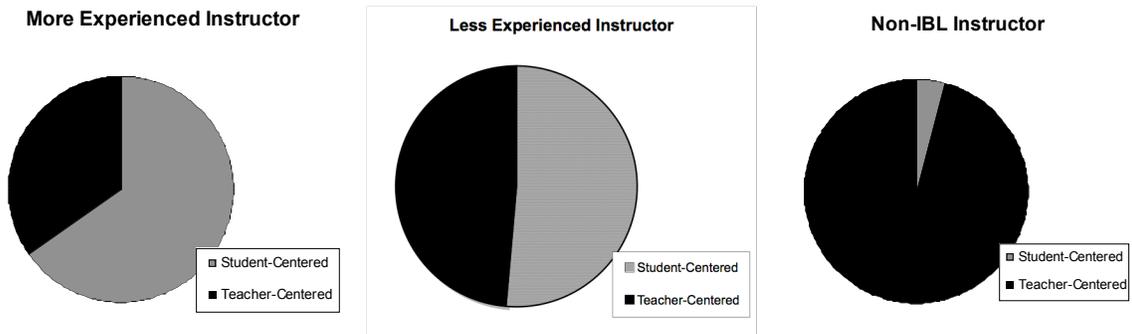
* *Repeat student* refers to a student who previously asked one or more questions in the same period.

	Advanced	Intro	PreServ	NON
<i>Mean proportion of...</i>				
... class time spent on student-centered activities (i.e. presentation, discussion)	73%	65%	56%	8%
... class time with students in lead role	57%	33%	26%	4%
... questions asked by students	28%	39%	16%	14%
... questions asked by repeat students*	11%	17%	7%	3%
... students who asked questions	48%	29%	26%	5%

Courses designated IBL, despite variation among them, still tend to be more similar to each other than to comparative non-IBL courses.

- **Campus tradition.** Individual campus traditions and institutional cultures appear to have a strong influence on *how* IBL is done.
- **Instructor experience.** Classes taught by instructors with more than two previous terms teaching IBL tend to be more student-led, more focused on student-centered activities, and have a higher proportion of student questions (Figure 4-1).

Figure 4-1: Mean Proportion of Class Time Spent in Lead Role



Experienced teachers appear to be more comfortable “handing over the chalk.”

Major Styles of IBL

- Many of the IBL courses observed to date fall into two major styles: Presentation-Based (more than 30% of class time spent on student presentations) and Group Work-Based (more than 30% of class time spent on group work).
- Despite different emphases, both styles are almost identical in terms of time spent on student-centered activities (student presentations, discussion, group work and computer activities) and with students in the lead role (Table 4-2).

Table 4-2 – Selected Indicators of Underlying Similarity between IBL Styles

Average proportion of time spent...	Presentation-Based (n=4)	Group Work-Based (n=4)
Doing student-centered activities	72 %	73%
With students in lead role	65%	67%

- Not every section falls neatly into these categories. Some distributed class time more evenly between presentation, group work and discussion, and a few classes that were designated IBL remained primarily lecture-based.

Different styles of IBL may be better suited to different student audiences

- 80% of advanced majors courses observed to date used a presentation-based style.
- 75% of introductory courses observed to date used a group work-based style.
- Future analysis will use several measures to look at the relationship between instructor choices, student needs, and different styles of IBL.

Limitations of the Study and Future Plans

- This data set currently includes only 20 sections and was limited to three campuses.
- Further analysis of observation data is planned to examine variation in the cognitive level of questions, gender and ethnicity of students, and overall classroom atmosphere.
- Statistical tests for significance have not yet been performed on these analyses.
- We also aim to elucidate links between observation data and student survey responses.