

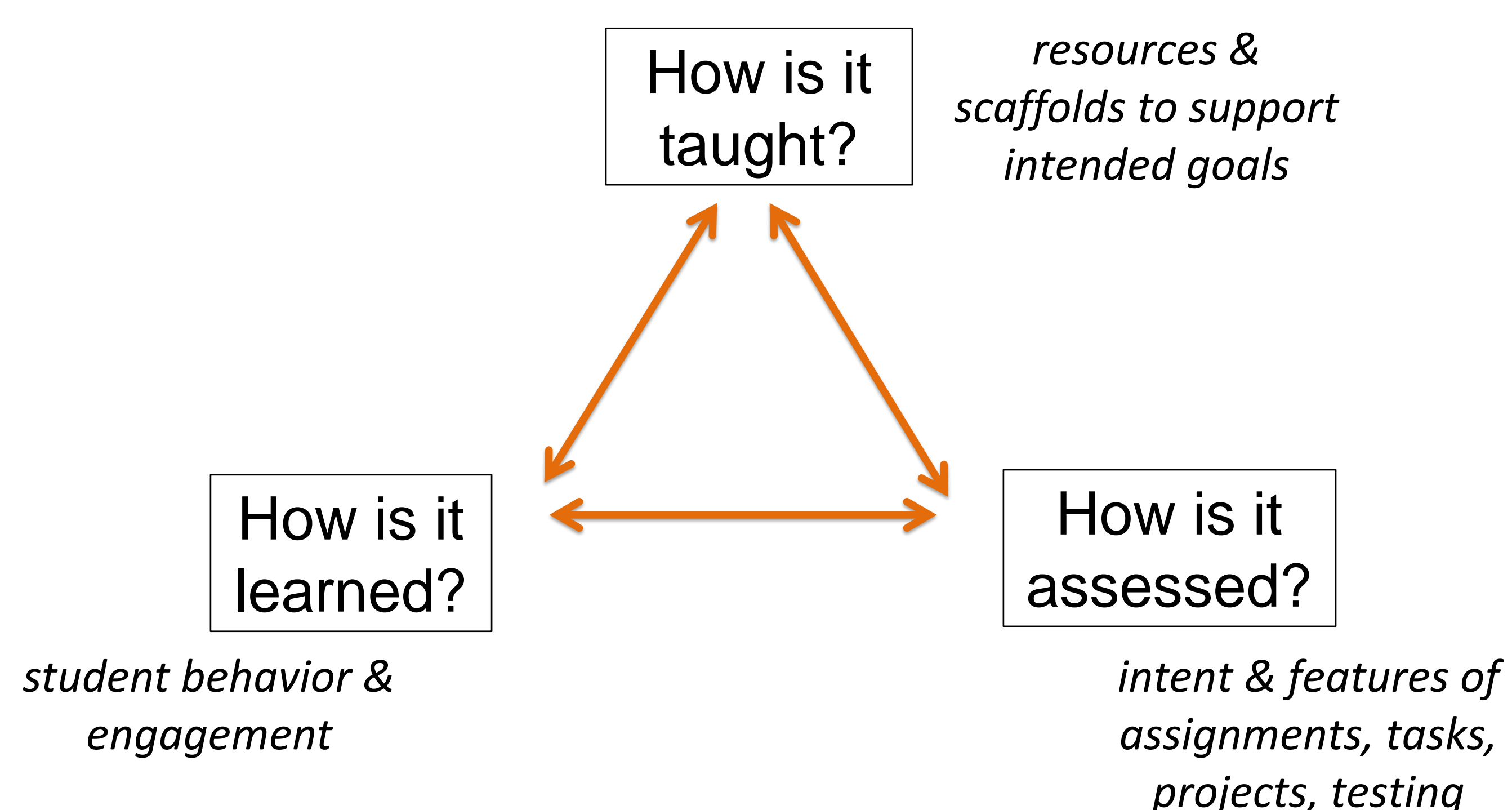
Ultimate Goal

Assess Meaningful Learning

the ability to identify and take relevant content and adapt/transfer into new situations

First Target: Instructional Design

Alignment of Three Questions



Research Design

Focus Groups

Consensus

- List any and all resources
- Indicate % of time resource involves/promotes active engagement
- Frequency of usage

Individual

- Rank top 4 resources used
- Evaluate how engaged you were when using resource
- What guidance were you provided to use resources

Longitudinal Study

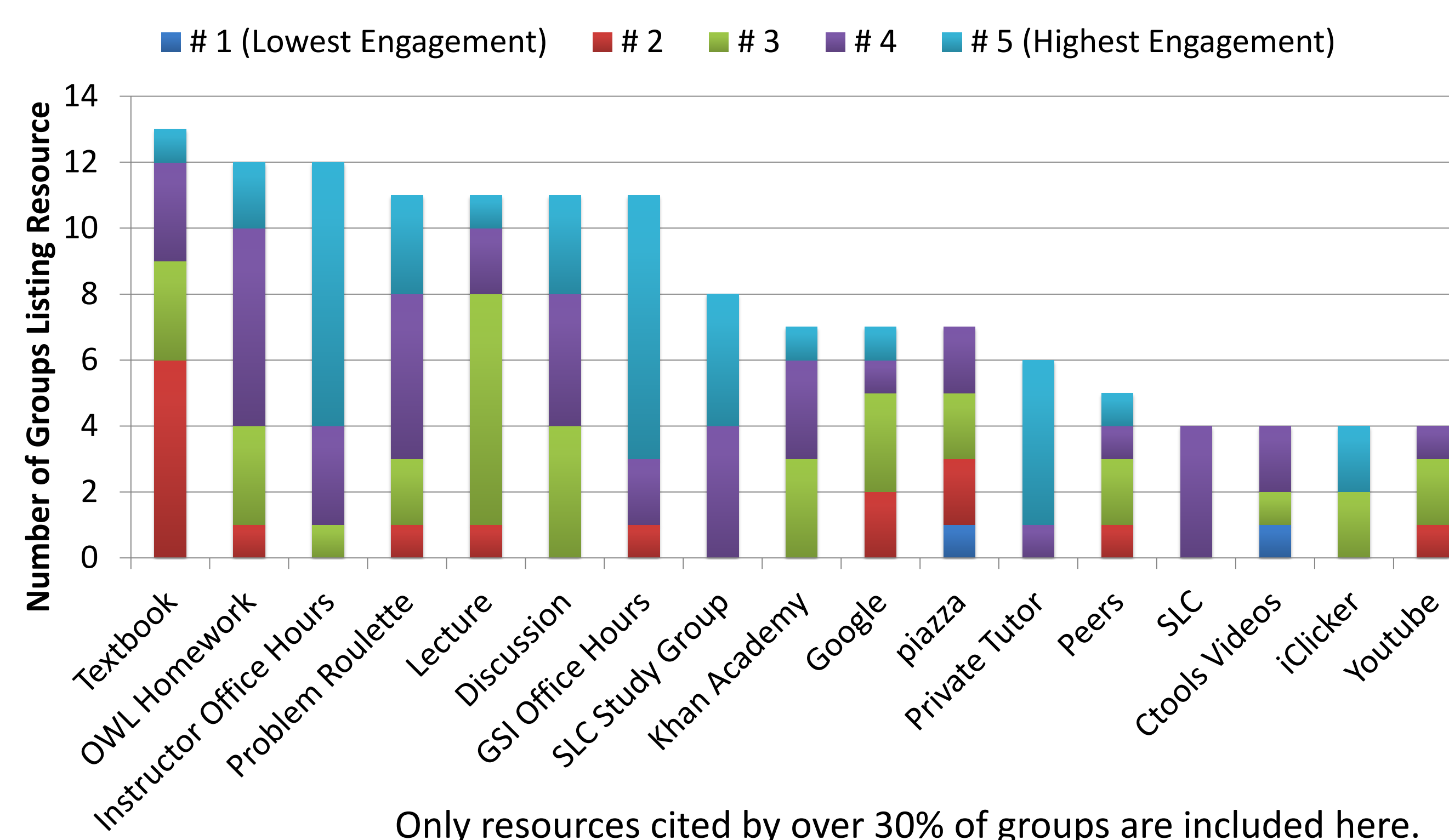
✓ Pre-semester Mid-Semester After Final

How is it Learned?

Method 1: Consensus Response

# of students in CHEM 130	# of students in focus groups	% of enrolled students	# of focus groups	average # resources listed per group
1283	38	2.9%	13	13.2 +/- 2.2

"As a group, list resources used for CHEM 130 & rank the level of engagement promoted by this resource" (n = 13)



Method 2: Individual Response

"List your top 4 resources & indicate your level of engagement when using this resource" (n = 38)

	Times listed in top 4	Average Ranking (1 = highest)	St Dev of Ranking	Average Engagement (5 = highest)	St Dev of Engagement
Problem Roulette	27	2.11	1.05	4.44	0.75
OWL	27	2.63	1.15	4.11	0.85
Lecture	20	2.15	1.18	3.60	0.94
Discussion	19	2.26	0.99	4.05	0.85
Textbook	19	2.95	0.97	3.53	1.07

"How were you informed of the resources available for this course?" (n = 38)

	count	% of respondents
by instructor	24	63%
word of mouth/peers/friend	14	37%
Ctools	10	26%
self-research	8	21%
"part of the course"/required	7	18%
email	7	18%
syllabus	4	11%

Only sources those cited by >10 % of respondents are listed.

Method 3: Longitudinal Student Surveys

Does student resource use change throughout the semester? If so, how?

Pre-Semester Survey: What resources do you intend to use to help you learn general chemistry? (n = 263)

resource	textbook	internet	lecture /notes	office hours	other students	study group	SLC	OWL	GSI	professor	tutor
% of respondents	74	34	33	32	30	29	17	16	15	12	11

Only resources cited by >10 % of respondents are listed.

Ongoing Work

How is it learned?

- Is resource usage modulated by previous chemistry course work?
- Does learning resource usage correlate with exam performance?
- Does resource usage vary across courses?

How is it taught?

- How do faculty and GSI perceptions of resource engagement compare and contrast with students'?

Inference From This Work

These early results suggest that much of learning is done outside the context of a classroom/textbook. To understand the process of student learning, and to understand "teaching" as the design and management of the entire learning environment, it is critical to extend the lens of investigation outside the confines of the classroom period.