

Queen's Learning Outcomes Assessment Project: Tracking student achievement and comparing utility of tools.

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Employer surveys



2006

57.5%— Critical Thinking/Problem Solving abilities are “very important”
(Conference Board report)



2013

93% agree, “demonstrated capacity to think critically, communicate clearly, and solve complex problems is more important than (candidates) undergraduate major” (AAC&U- Hart Research)

Learning Outcomes Assessment (LOAC)



Queen's
UNIVERSITY

Goal

1. Complete longitudinal study of **intellectual skill development** in undergraduate students
2. Develop strategies for **sustainable assessment** within course contexts
 1. Develop processes for implementation and assessment of **university-wide learning outcomes**
 2. **Faculty development** around learning outcomes and assessment
 3. Analysis of **measurement tools**

Lifelong learning

Critical thinking

Problem solving

Communication

Learning
Outcomes
Project

Value proposition for...



instructors:

- awareness of transferrable skills
- enhanced understanding of assessment

students:

- instruction emphasizes transferrable skills
- receive a summary of their performance

institution:

- data on achievement of learning outcomes (value add)
- knowledge about logistics of implementation and correlations among measures
- not only staying ahead of the curve but helping to invent the next curve

4 Outcomes

4 Tools

4 Disciplines

4 Years



Critical thinking
Problem solving
Written communication
Lifelong learning

CLA+
Collegiate Learning Assessment

CAT
Critical Thinking Assessment Test

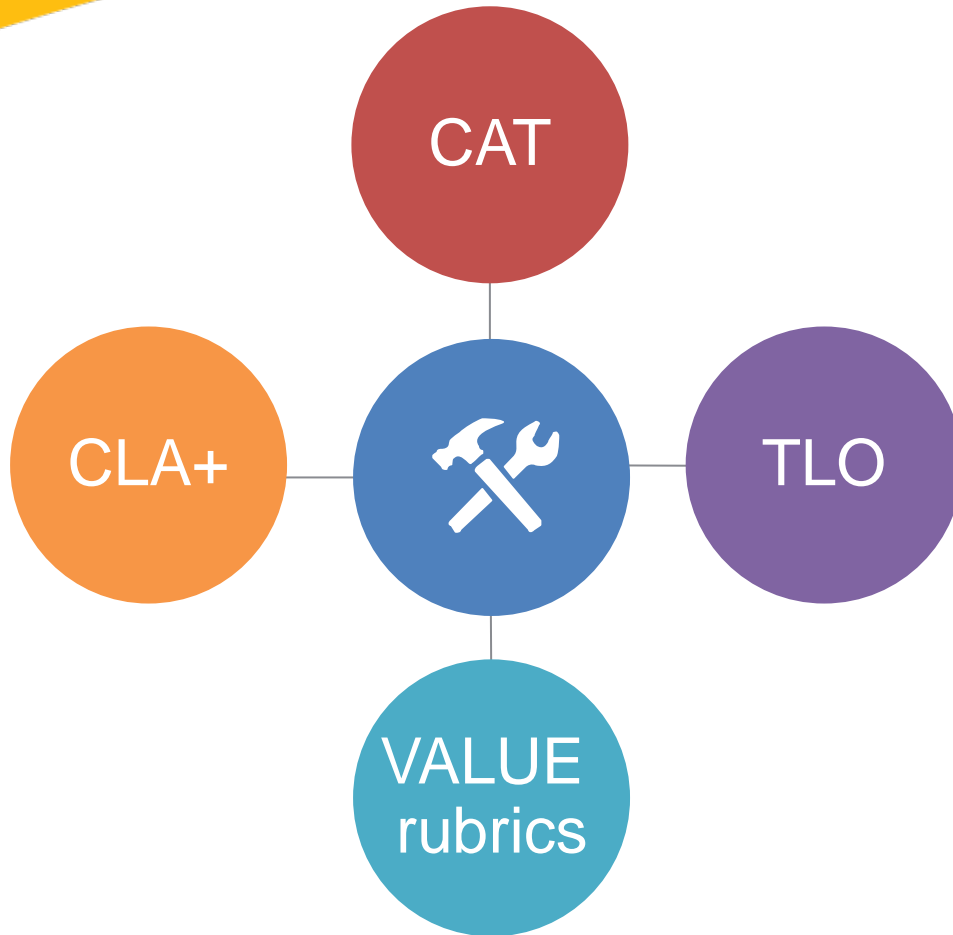
VALUE Rubrics
Valid Assessment of Learning in Undergraduate Education

TLO
Transferable Learning Orientations Survey

Engineering (all departments)
Drama
Physics
Psychology

Tracking through all four years of study

Assessment Tools



● **CRITICAL THINKING ASSESSMENT TEST (CAT)**

A short-answer essay based standardized intended to measure problem solving and critical thinking by posing questions related to real world topics.

● **COLLEGIATE LEARNING ASSESSMENT (CLA+)**

Online standardized test created for the purpose of measuring scientific reasoning, critical reading and evaluation, problem solving and critiquing arguments skills in higher education.

● **VALID ASSESSMENT OF LEARNING IN UNDERGRADUATE EDUCATION (VALUE) RUBRICS**

Course artifacts rated with critical thinking, problem solving and written communication rubrics.

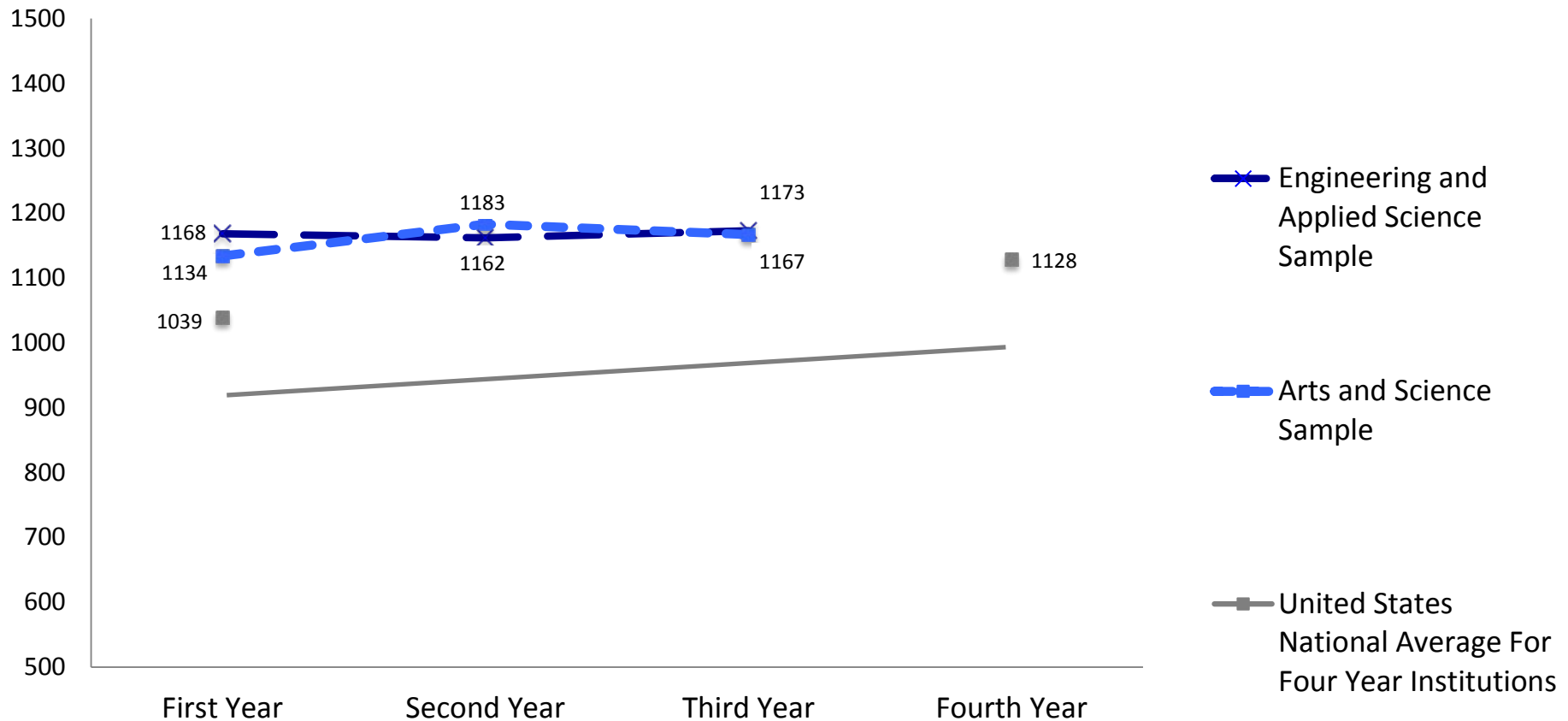
● **TRANSFERABLE LEARNING ORIENTATIONS SURVEY (TLO)**

Self-evaluation of learning orientations self-evaluation-strategies for lifelong learning.

CLA+ Collegiate Learning Assessment



CLA+ Total Score Comparative Means



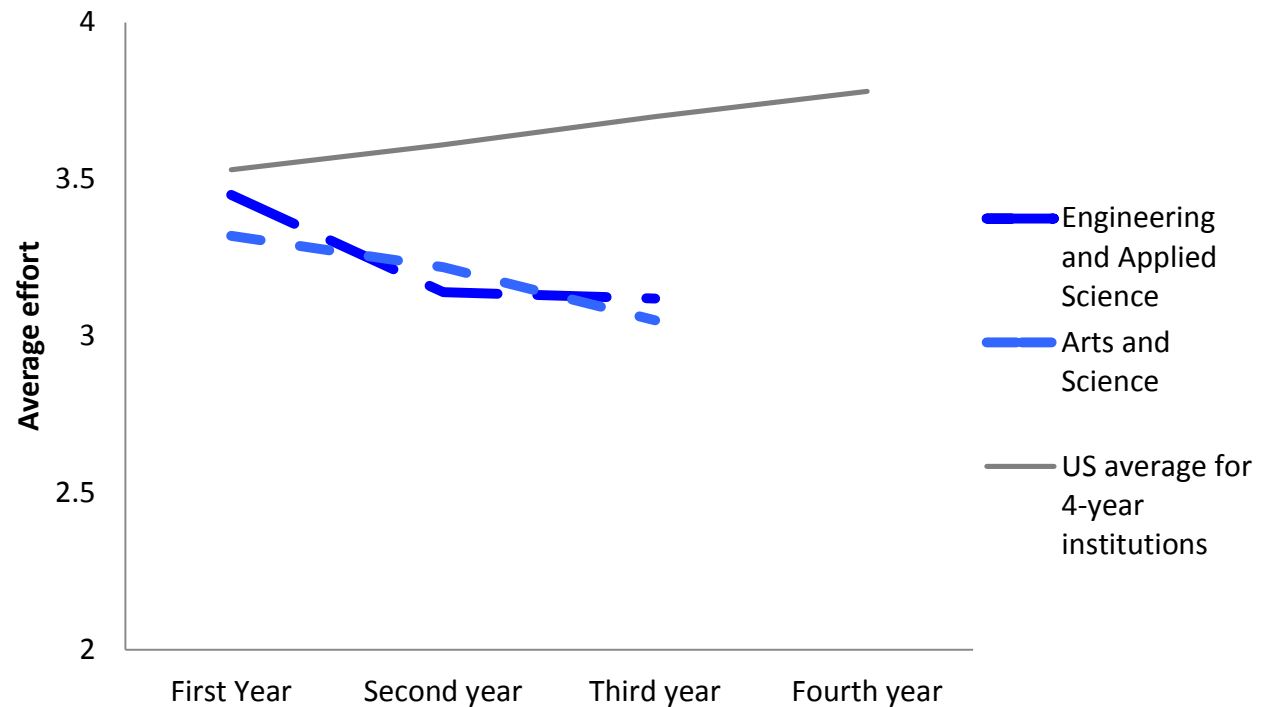
Strategies to address decline in student effort



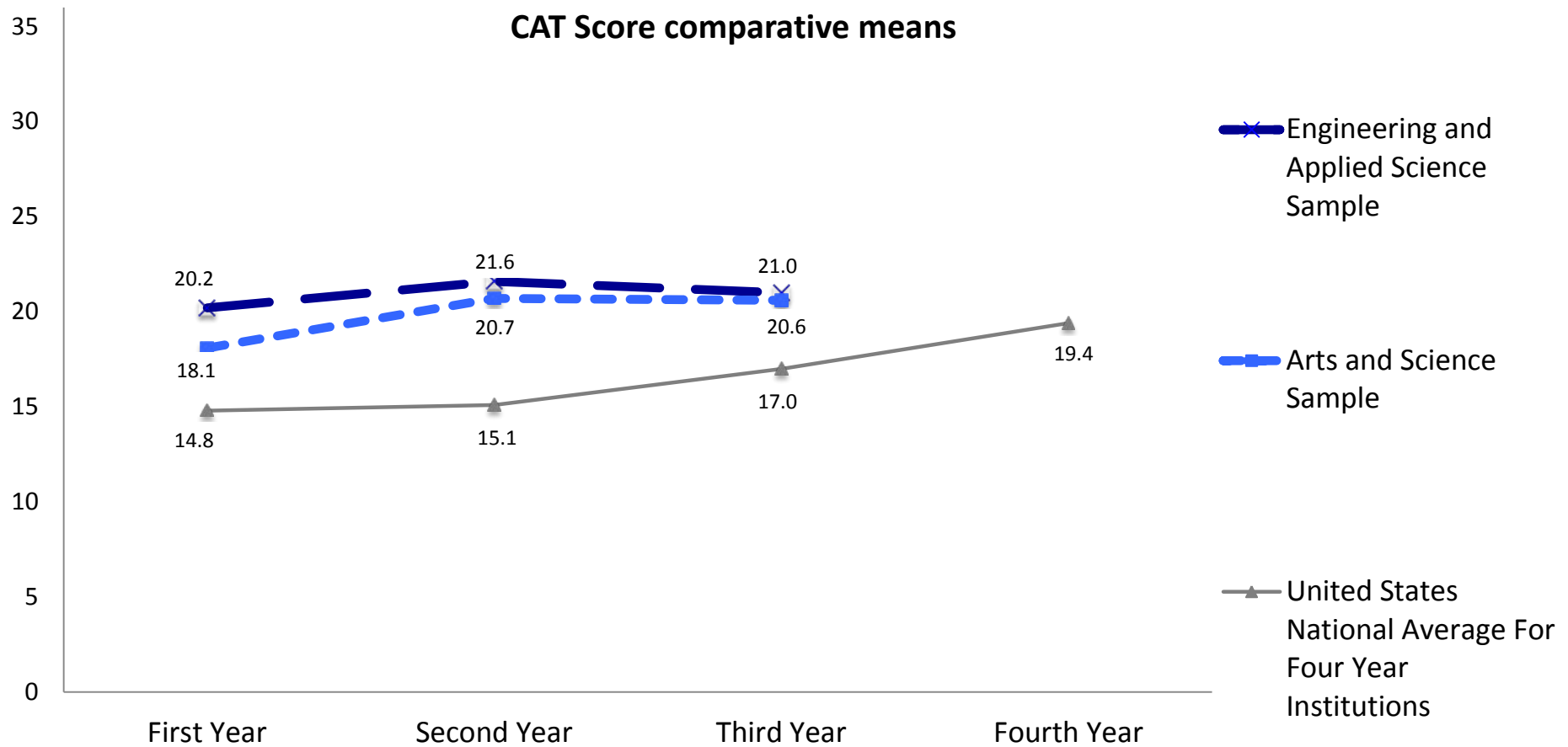
There is a direct relationship between the level of effort self-reported in the test and the test score.

- Contact students via email and provide rationale for testing
- Provide individualized student achievement reports for each student
- Provide incentive payment for test-takers

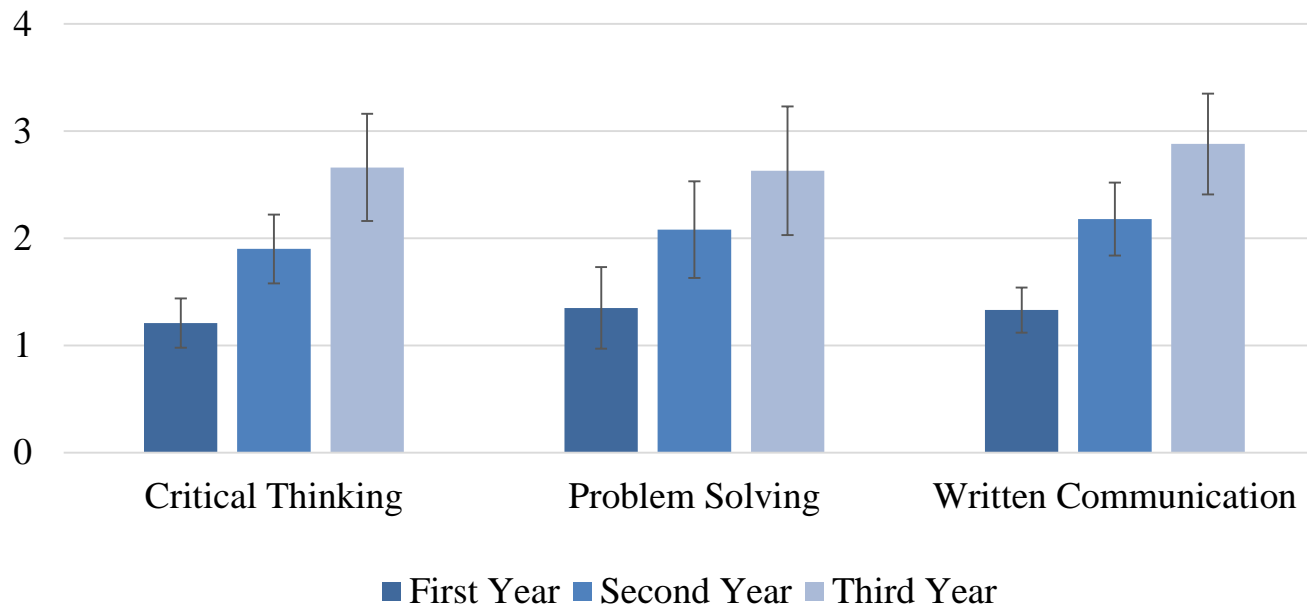
CLA+ Self-reported effort



CAT Critical Thinking Assessment Test



Value Rubric Assessment



1st year ($n=162$)
2nd year ($n=180$)
3rd year ($n=67$)

Faculty of Arts and Science average scores for critical thinking, problem solving, and written communication dimensions of the VALUE rubric



Learning Outcomes Project

Student Report



Departmental Report

- Feedback on student performance (not instructor performance)
- Debrief results with instructors
- Support for adopting changes to assessments in courses and programs

Introduction

This report is provided to the X department as a summary of results from the Queen's Learning Outcomes Assessment Project. This report provides feedback on the progression of student learning through the assessment of learning outcomes in undergraduate education. A sample of students from first, second, and third year X courses participated in one of two standardized tests: The Collegiate Learning Assessment (CLA+), or the Critical Thinking Assessment Test (CAT). Additionally, these students provided feedback through the Transferable Learning Orientation (TLO) Survey, and participating students contributed course work samples that were rated using the Valid Assessment of Learning in Undergraduate Education (VALUE) rubrics. Figure 1 provides an overview of project instrumentation. Student focus groups, instructor feedback, and course outcome scores have yet to be evaluated. This report will compare student performance in all three years, however will place a greater emphasis on performance in third year, as details of first and second year performance are already available in previous reports (contact natalie.simper@queensu.ca).

Summary

In order to evaluate student academic performance through the achievement of learning outcomes, X students were assessed using a variety of measurements including the CLA+, CAT, TLO, and VALUE rubrics. CLA+ results indicated increased critical thinking scores from first to second year, but relatively consistent scores from second to third year. The results from the CAT indicate that the X sample demonstrated an increase in critical thinking abilities from first to third year. Participating students reported attitudes and approaches to lifelong learning in line with the collective sample. Course-work samples from first to third year were evaluated for critical thinking, problem solving, and written communication, using the VALUE rubrics. Results indicate significant increases from first to second year, and second to third year on all dimensions of the rubrics.

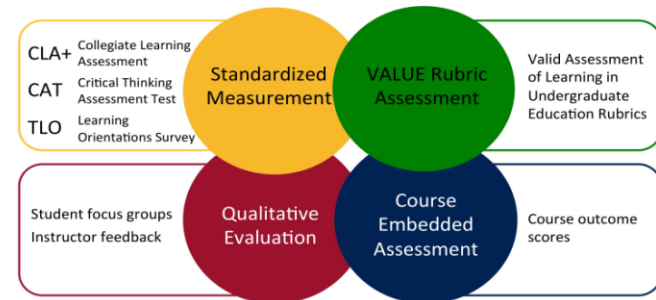


Figure 1. Learning Outcomes Assessment Project overview of instrumentation.

Note: The first year sample for all sections of this report include non-X majors, as the course all first year data was collected from was in an introductory X course, open to all students.

Assessment tools comparison table



TOOL	Student engagement	Logistics	Faculty utility	Cost
VALUE rubrics				
Critical thinking Assessment Test (CAT)				
Collegiate Learning Assessment (CLA+)				
	Highly engaged	High utility for course improvement	Minimal logistics	Minimal costs
	Somewhat engaged	Somewhat useful for course improvement	Some logistical issues	Mid-level costs
	Minimal engagement	Limited utility for course improvement	Complex logistics issues	Substantial costs

Based on feedback, 12 of the 28 Instructors have made changes to their courses...



Redesigned the final **lab for open ended problem solving**

Redesigned the extended response answer in the final exam (design a research study) to **address critical thinking and problem solving**

Redesigned a learning lab (Academic achievement), and **changed the assessment structure**

Redesigned two assessments

Redesigned the annotated bibliography and research essay to **directly assess critical thinking**

Redesigned **e-portfolio to align with problem solving** VALUE rubric dimension

Redesigned production evaluation to **focus specifically on critical thinking**

Redesigned the course to **incorporate** an "argumentation" component

Moved to specific assessment of **critical thinking in the fourth year field work unit**

Redesigned 4th year final exam question to **authentic case-based problem**; continued in the following year to adopt a group approach for the problem, with graduate students as team leaders

Redesigned the 2nd year **problem solving task and include a 4th year leadership** component

What is necessary to encourage student motivation and effort?



✓ Instructor valuing the test results

"It has an effect on whether or not students feel the need to participate"

✓ Ensure test content familiarity

[Motivation for a particular test] "depends on your past experiences ". "I didn't like the [tests] where it was medical stuff and reading. . . But it could have been I just don't have knowledge in that subject area so I found it harder to draw connections"

✓ Well timed testing (and not repeating the same test each year)

Avoid times when students are busy with other commitments related to their degrees "It depends on what else is going on"

✓ Provide feedback on achievement

"If it was one [a score] they could post like a qualification"

✓ Provide monetary incentive

"Offering free food and monetary gifts"

○ Make the test score count

"If you wanted to really make sure that you have the students engaged and performing at their best you have to make it a course assignment"

Next Steps



Dependent sample
between first and fourth
year to draw a more
generalizable conclusion

\$\$ Incentive for
fourth year students
to test

Encourage participation
from students in all
engineering disciplines

Look for better alignment
for fourth year artifacts
(e-portfolio?)

