



Using data to influence quality and make decisions

Colloque BCAPG 2018: EGAD Workshop

Brian Frank

Instructions: Please form groups with people from different institutions and introduce yourself. Share one way that assessment has influenced your program.





EGAD Project

- Who:** 17 Faculty and Staff across Canada, supported by engineering deans
- Goal:** Training and resources to support assessment and curriculum development
- How:** Encourage good practices to support learning in engineering that will also meet CEAB requirements.

egad.engineering.queensu.ca

Recent EGAD Workshops

March 2017

Atlantic GA (Moncton)

June 2017

CEEA (Toronto)

June 2017

GA West (Kelowna)

December 2017

GACIP (Toronto)

May 2018

AMEGA (Charlottetown)

June 2018

CEEA 2018 (Vancouver)

CEEA 2018: EGAD Workshops

EGAD Workshop # 1 - Running a continuous improvement process in engineering

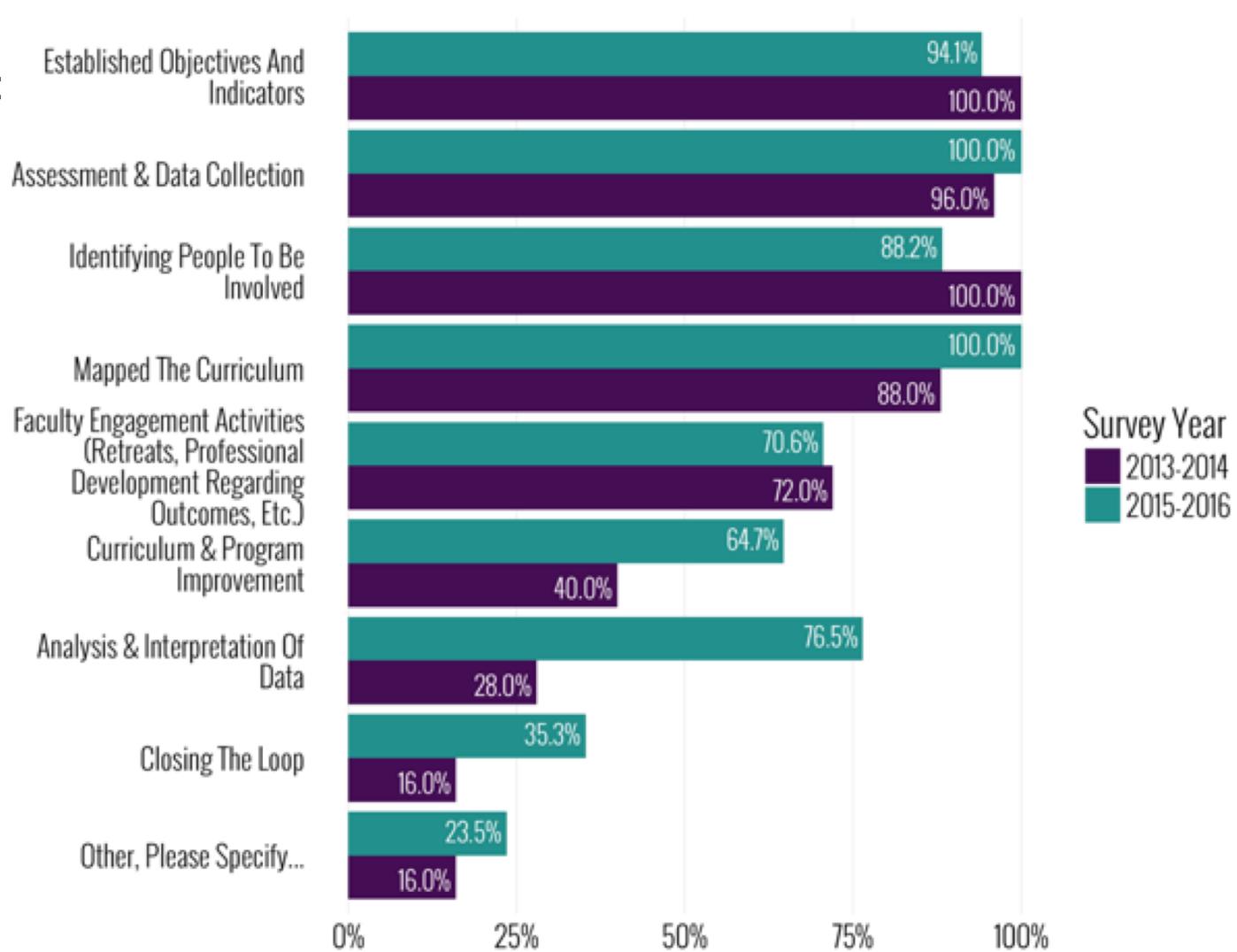
EGAD Workshop # 2 – Working with Data

Activity 0

Instructions

Finish introducing yourself to your group and share one way that assessment has influenced program delivery at your institution.

Survey of Canadian Engineering Programs: 2013, 2015





Workshop Goals

1. Identify how assessment can influence program improvement.
2. Identify factors that influence decisions based on your assessment data.

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Addressing CEAB Criteria:

3.2.1: Improvement process: There must be processes in place that demonstrate that program outcomes are being assessed in the context of the graduate attributes, and that the results are validated, analyzed and applied to the further development of the program.

3.2.3 Improvement actions: There must be demonstration that the continual improvement process has led to consideration of specific actions corresponding to identifiable improvements to the program and/or its assessment process. This criterion does not apply to the evaluation of new programs.

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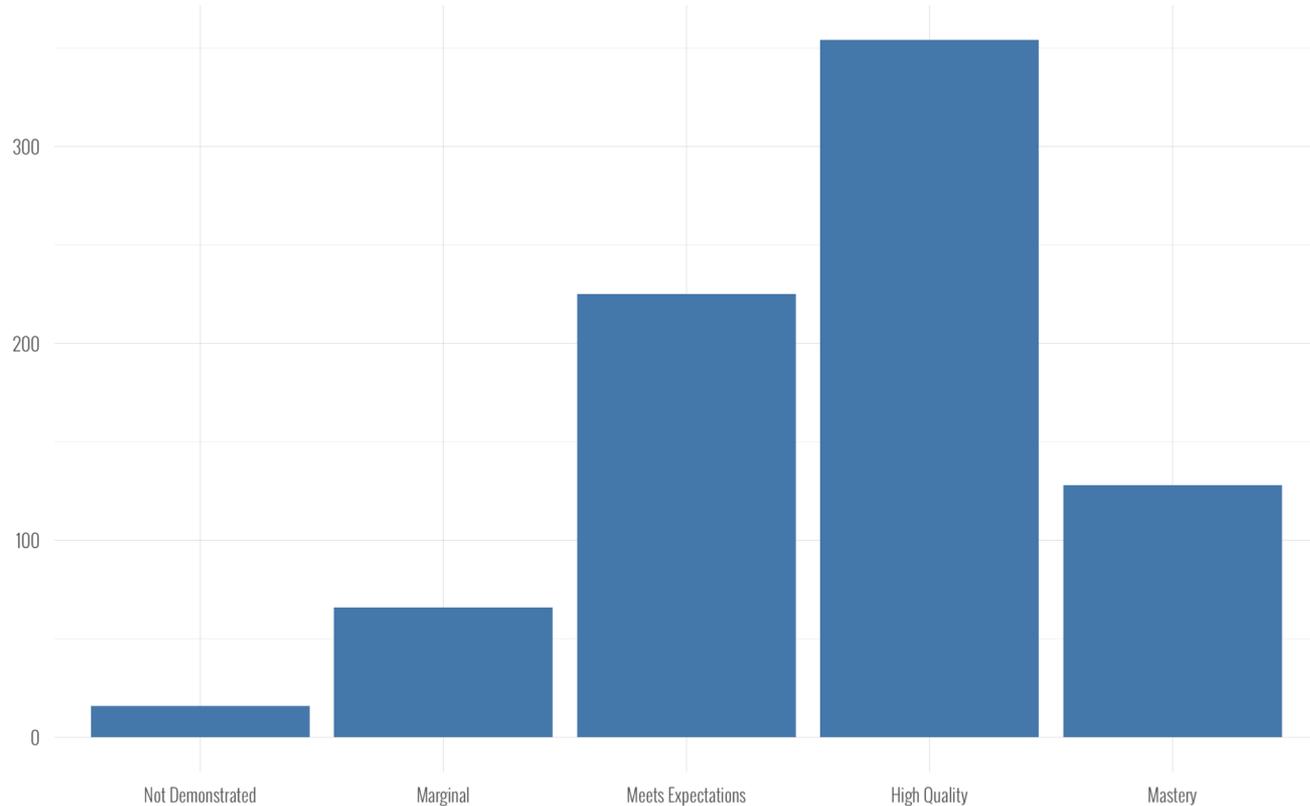
3.2.3 Improvement actions: There must be demonstration that the continual improvement process has led to consideration of specific actions corresponding to identifiable improvements to the program and/or its assessment process. This criterion does not apply to the evaluation of new programs.

What influence is assessment having?

Within 1 course after 1 year of assessment

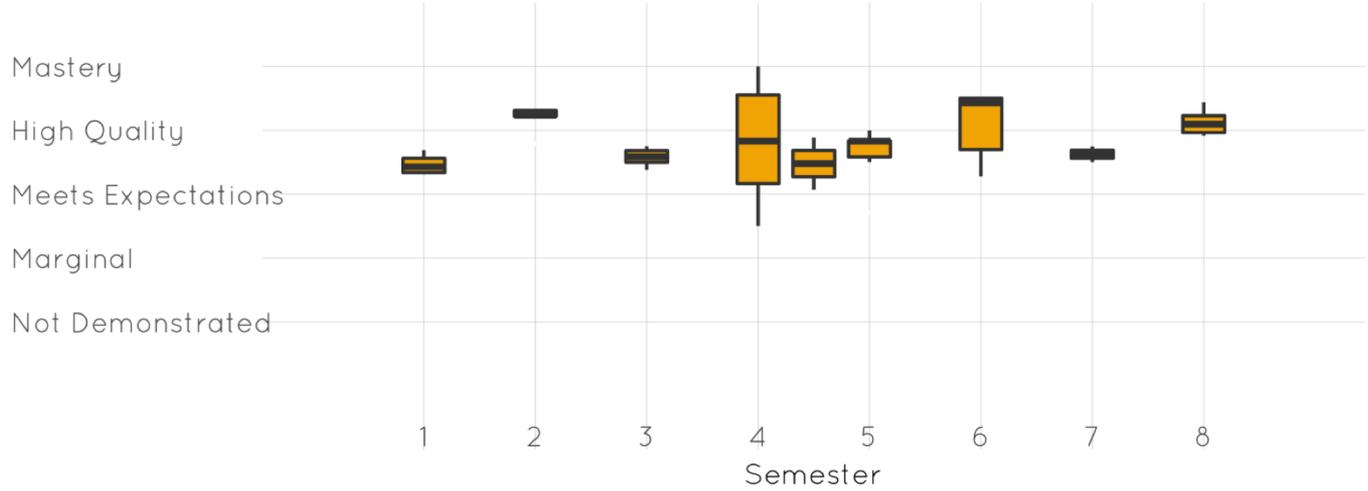
Histogram/Bar Chart of Student Performance

Number of students by performance level

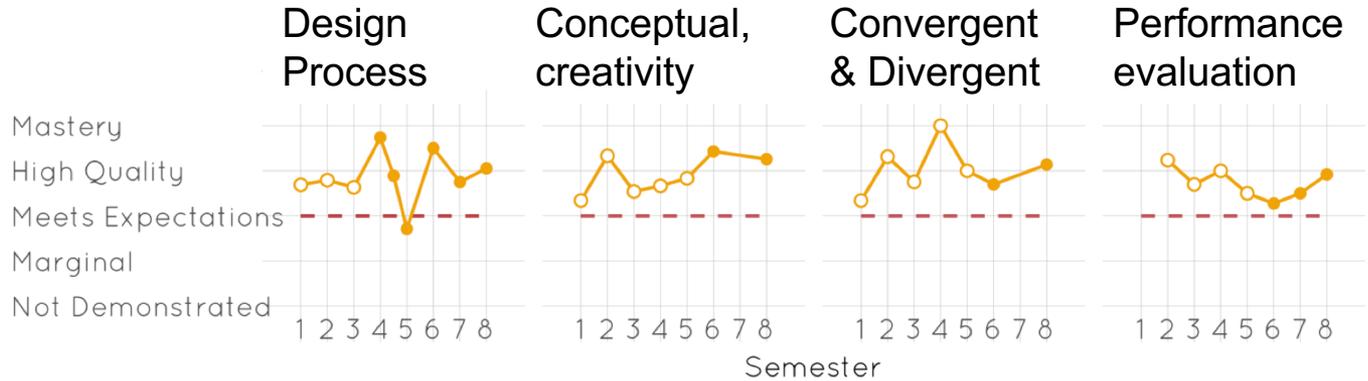


Data from one year's assessment from all years of program

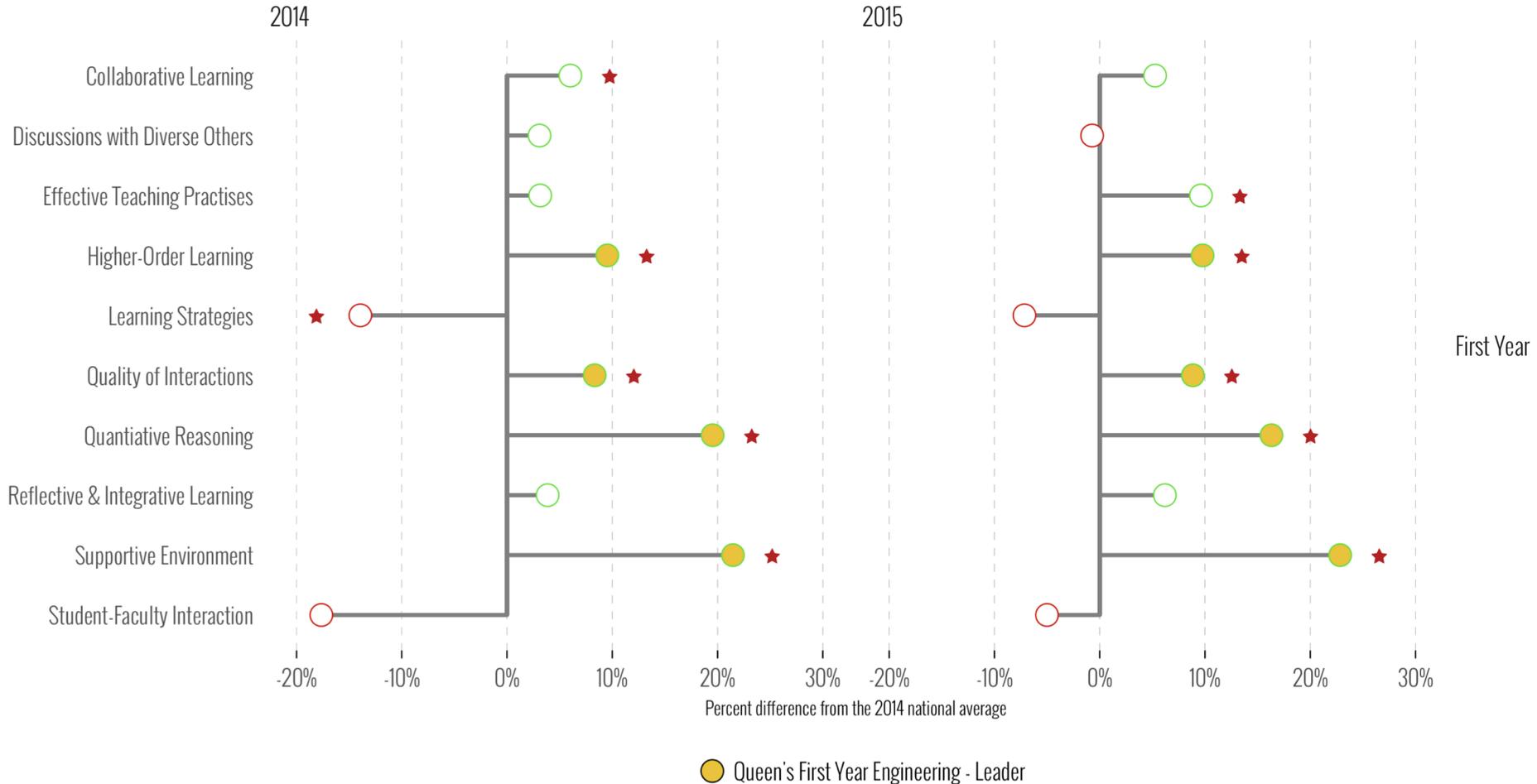
Design Overview



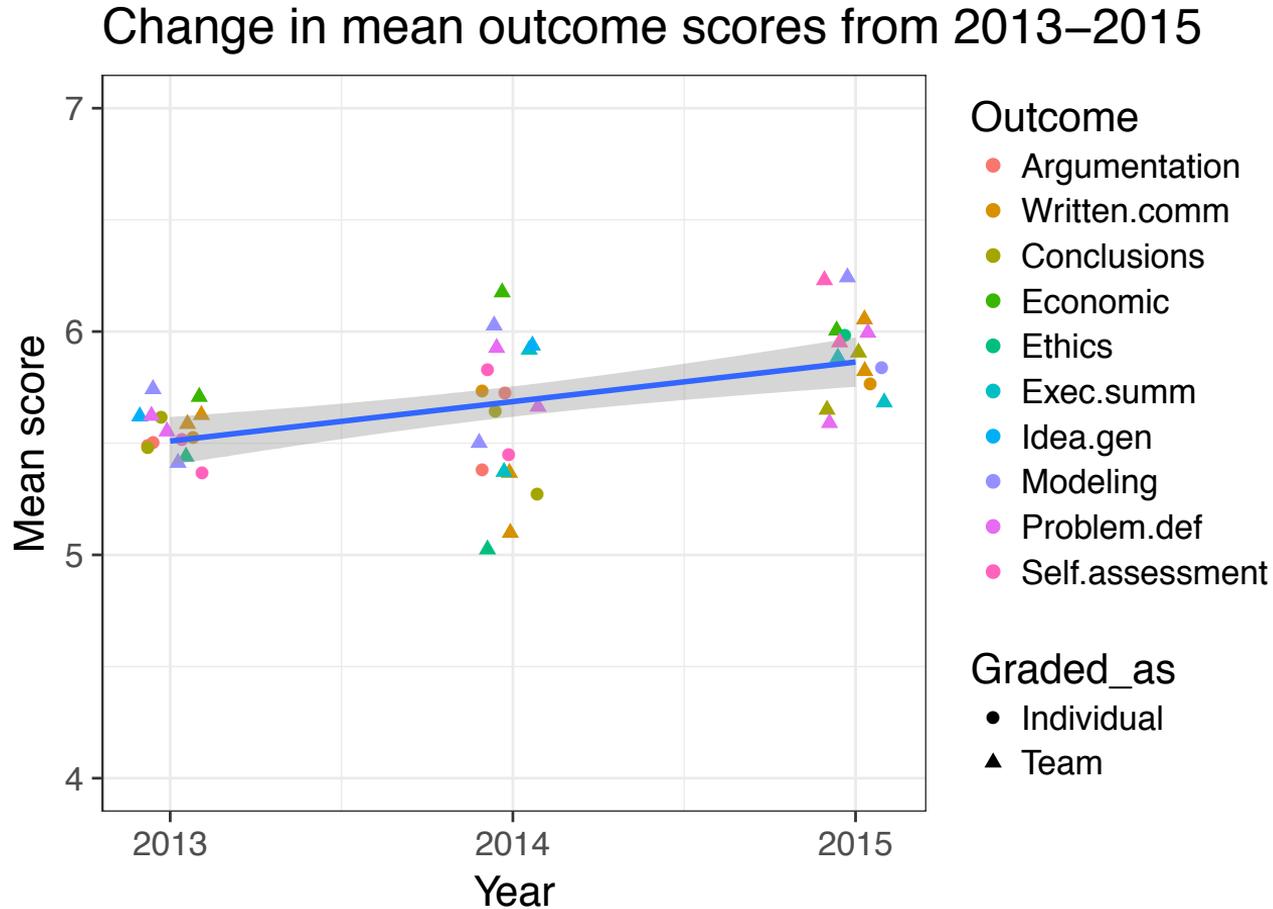
Samples of Design Indicators



National Survey of Student Engagement (from national sharing agreement)

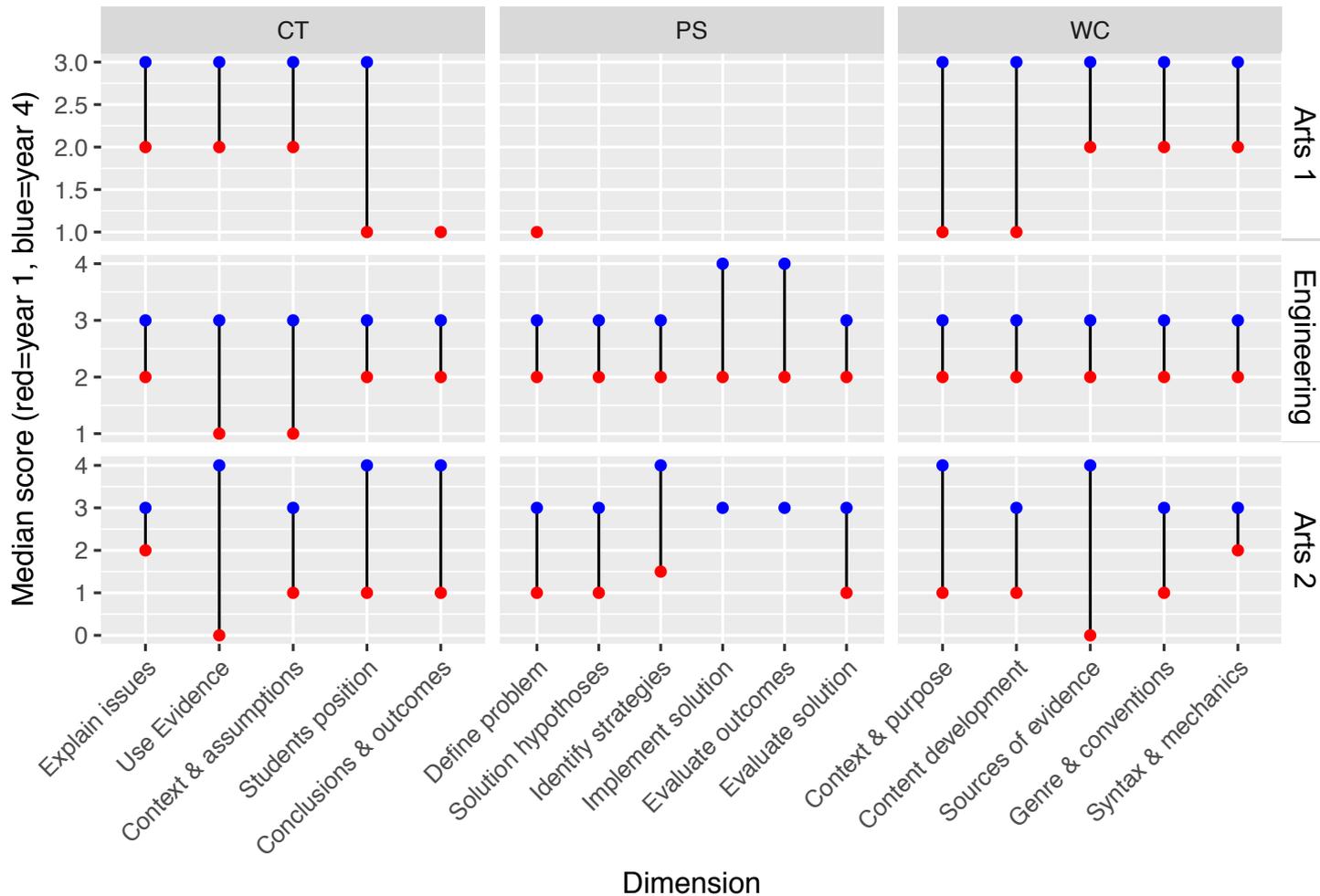


Within 1 course after multiple years of assessment



Within program
after 5 years of
tracking a
cohort

Change in rubric dimension from year 1 to 4



Steps in order to *close the loop*

(i.e. gather evidence, make change, and gather evidence that change was effective)...

- Gather, evaluate, improve assessment (1-5 years)
- Re-assess until data is trustworthy (more years)
- Make curriculum changes (another year)
- Evaluate success of changes (another year)

This is a multi-year process!

Can assessment data be useful more quickly?

How else can this process be useful?

Broadening thinking about influence of assessment

Jonson, J. L., Guetterman, T., & Thompson Jr, R. J. (2014). An integrated model of influence: Use of assessment data in higher education. *Research & Practice in Assessment*, 9.

<http://bit.ly/Jonson2014-UsingData>

“... a narrow conception of what constitutes *use* contributes to the conclusion that assessment results typically do not lead to improved educational practices and student learning. If definitions of use are too narrowly defined, some assessment efforts may be considered failures when those **efforts actually may have been very transformative but in unexpected or *slowly evolving ways*.**”

Broaden *Using* data to *Influence*

Jonson et al. (2014) used a model to code 19 reports documenting assessment methods, results, and conclusions at a research university.

Effects of assessment data can include:

Instrumental	Findings influence actions or decision making (traditional interpretation of “use”);
Conceptual	Evaluation leads to different understandings or enlightenment
Affect	Disposition, emotion, or tendency
Affirmation	Findings confirm effectiveness of existing practices, policies or understandings

Assessment Data and Influence (Jonson 2014)

Table 1

Heuristic Model of Influence: Dimensions, Subtypes, and Definitions

Dimension	Subtype	Definition
Sources of Influence	Findings-based	Based on student learning evidence
	Process-based	Based on evidence about the process of assessment rather than on learning evidence including consideration of methodology or data (e.g., measurement issues, sample size).
Effects of Influence	Instrumental	Involves a direct action or a decision and commitment to take educational practice or policy actions.
	Conceptual/Cognitive	Involves new understandings, ways of thinking, or processing information that may lead to considering action but lacks the actual commitment to act.
	Affect	Involves participant's disposition, emotions, or tendency regarding assessment process or assessment evidence
	Affirmation	Involves a confirmation of the appropriateness or effectiveness of an existing practice, policy, or understanding.
Results of Influence	Improved student learning	Results in evidence of improved student learning.
	Personal transformation	Results in a personal transformation of stakeholders (e.g., feeling empowered and motivated, changes of beliefs).
	Communities of practice	Results in building new or strengthening existing communities of practice.
	Symbolic/Political	Results in generating or sustaining support for policies or practices.
Time of Influence	Immediate	Occurs concurrent with the assessment process.
	End of Cycle	Occurs surrounding the conclusion of an assessment cycle (e.g., end of term)
	Long-term	Occurs in the future or extends beyond the assessment cycle.

Examples (Jonson 2014)

Coding Results: Findings-based Sources of Influence and Effects of Influence Dimensions (n = 28 cases)

Effects of Influence	Case Examples
Instrumental (n = 6)	<p><i>Students write at an acceptable level but continue to struggle with expressing their ideas in a concise and readable way. Several adjustments have been made to help students produce acceptable writing. Specifically, a phased sequence of topic selection, outlining, rough drafts reviewed by instructor and peer groups members has been used.</i></p> <p><i>Paper structure is being modified to focus on the application of core concepts. Specifically, common ... problems are presented to students; students select one and (i) identify three core concepts related to the problem, (ii) develop an intervention, (iii) discuss how the intervention will impact core concepts, and (iv) develop a plan to assess the efficacy of the intervention. Hopefully this will force student to relate what they learn to the (real world environment)</i></p>
Conceptual (n = 6)	<p><i>Faculty submitted samples of various types of questions with a range of difficulty, indicating that students found defining terms and identifying images easier than the more interpretive, analytical question that links work with more than one issue/answer.</i></p> <p><i>Based on the letters evaluated, students demonstrated good technical knowledge, but some are in need of improved writing skills. Additional writing exercises may need to be incorporated into subsequent courses, so that students have additional opportunities to enhance their writing skills.</i></p>
Affirmation (n = 9)	<p><i>Results of artifacts that demonstrate students' mastery of the student learning outcome seem to affirm the effectiveness of the department's efforts.</i></p> <p><i>Assessment results confirmed what we already knew from the (exam) reports that student learning (of) the learning outcomes is high. No program changes are planned.</i></p>

Engineering examples

Effects	Examples
Instrumental	<ul style="list-style-type: none">• Course modification as instructor identifies deficiency in certain learning outcomes (e.g. evaluating information credibility)• Weakness in one attribute (e.g. problem analysis)• Program modification resulting from gap in curriculum map (e.g. ethics)• Reconsider volume of content (e.g. reduce workload)• Decision to spread workload better over a term• Decision to revisit indicators to be more relevant and measurable
Conceptual	<ul style="list-style-type: none">• Better understanding of industry and student concerns as a result of involving them as a stakeholder (e.g. importance of multidisciplinary groups)
Affect	<ul style="list-style-type: none">• Interest in regular agenda item on department meeting to talk about learning• Widespread recognition of value of active learning
Affirmation	<ul style="list-style-type: none">• Able to articulate student abilities to prospective students and employers (“Your students are able to communicate and collaborate on their first day, and students are better prepared to work on teams than those from other engineering programs.”)• A common departmental perspective on ability

Activity 1

Instructions

Use the modified **Influence framework** (handout) to identify examples of the influence of assessment data at your institution.

Designate a note-taker to report out after the discussion.

Report out from Activity 1

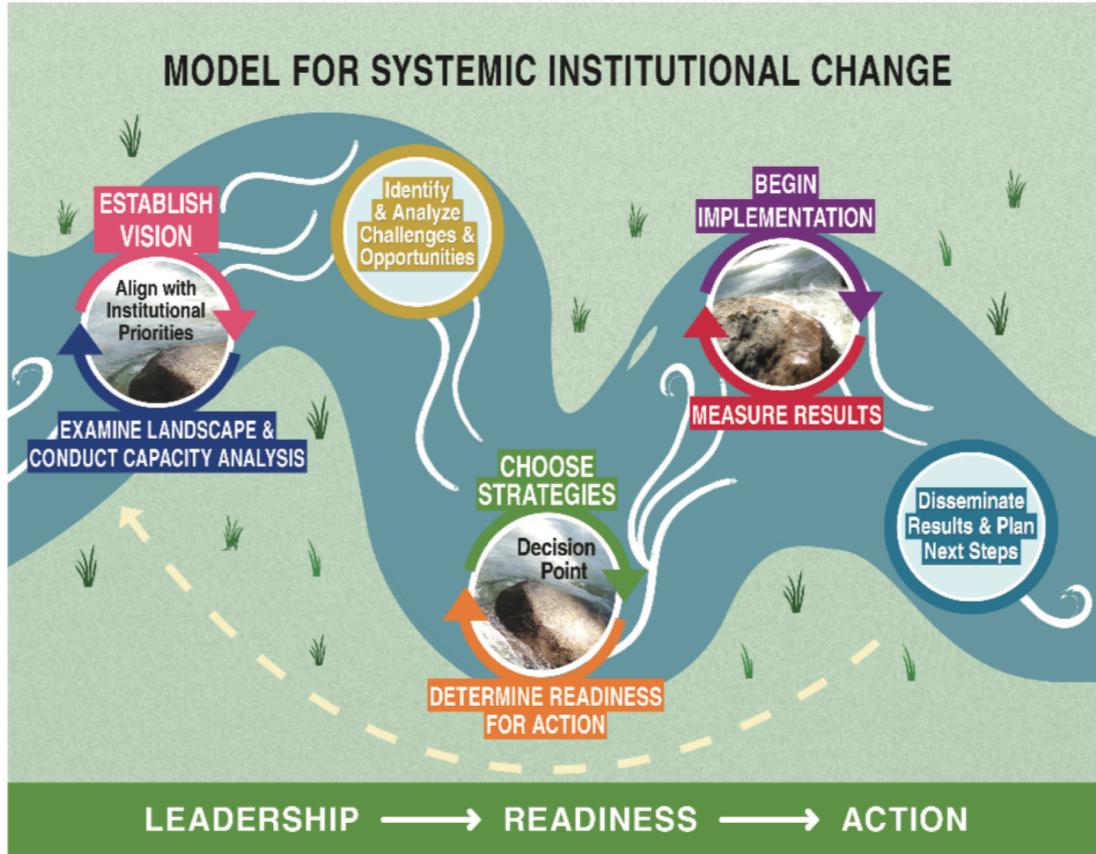
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Change processes



Elrod, S., & Kezar, A. (2017). Increasing Student Success in STEM: Summary of A Guide to Systemic Institutional Change. *Change: The Magazine of Higher Learning*, 49(4), 26–34.

Factors that impact making decisions from data

A. Factors about data validity

- Reliability - consider multiple direct measures, plus indirect measures
- Significance of performance gap
- Known context about source of data

B. Factors about people

- What stakeholders are involved, and at what point in the process? People as data sources vs. Decision makers
- Who influences vs. makes decisions?

C. Factors about process

- Is work involved appropriate for the significance of the issue
- Timing - how often is evidence discussed, when
- Degree to which it supports long-term goal of improving student ability
- What is the official process (flowchart)
- How is data aggregated and reported at various points in process

Group Activity 2

Pick some examples of Instrumental effects from Activity 1

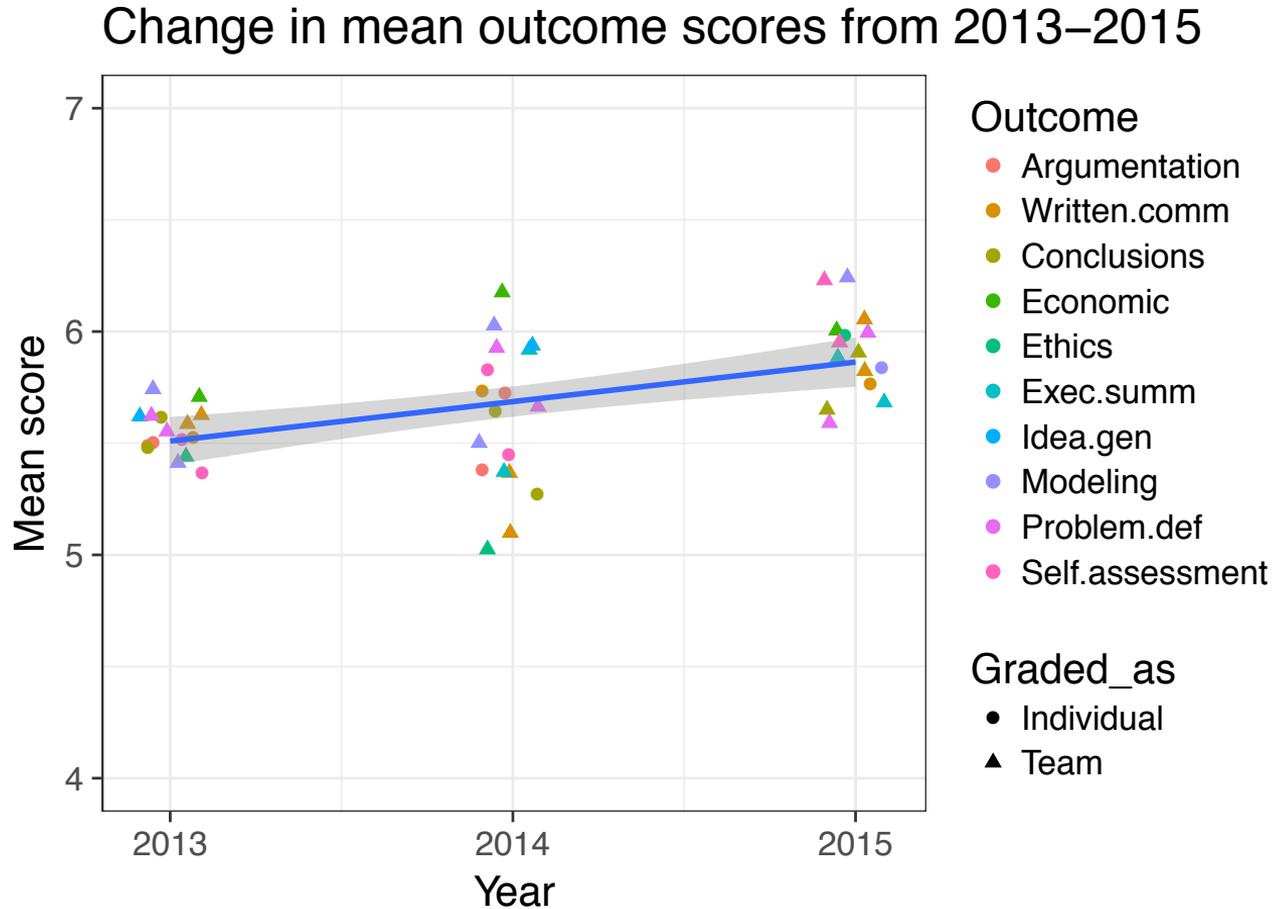
How do the factors influence *Instrumental use* (decisions or actions) of assessment data (handout side 2) ?

Designate a note-taker to report out after the discussion.

Report-out

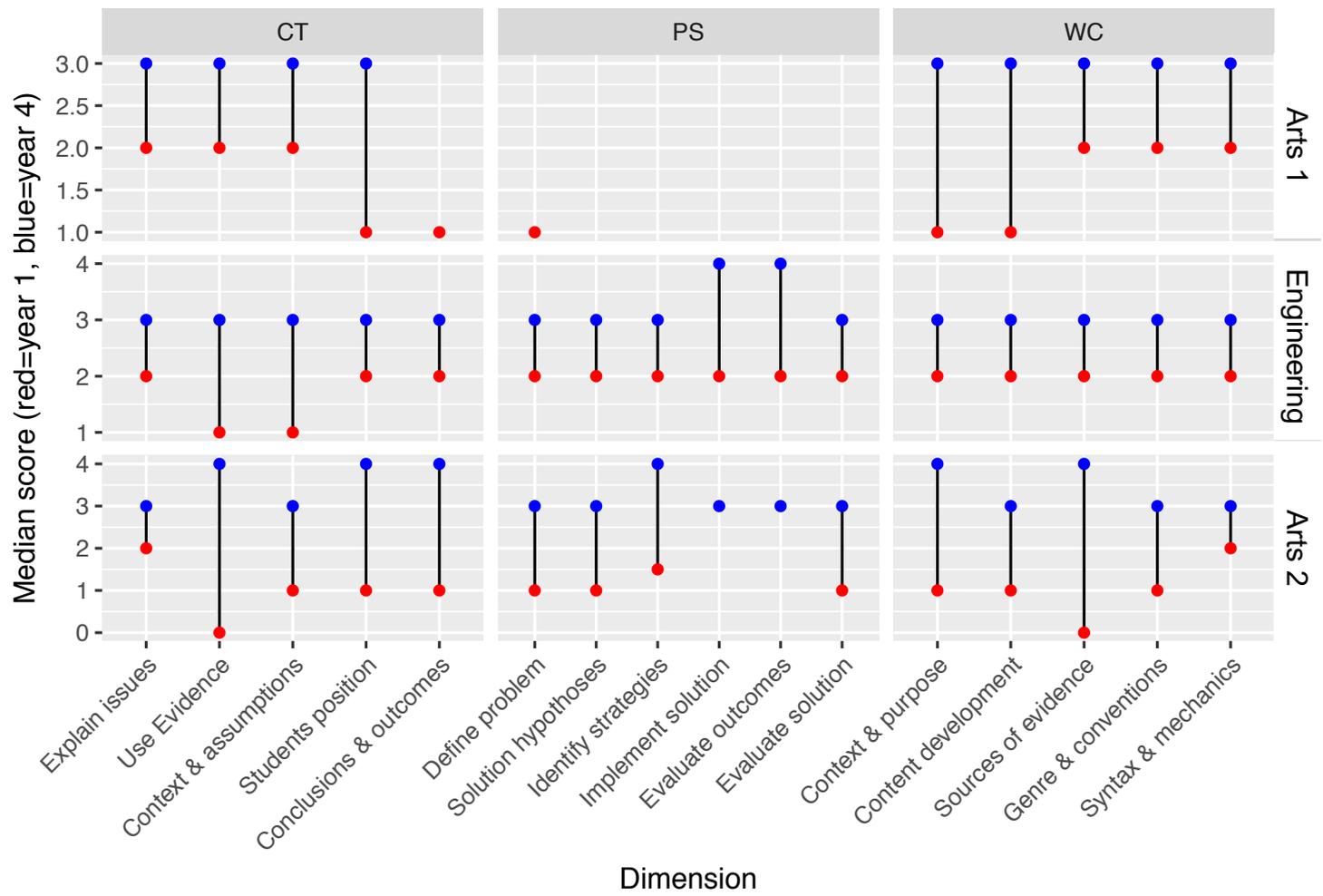
How many feel they can draw ***some*** valid conclusions from assessment data sufficient to warrant a change in a course or program?

Within 1 course after multiple years of assessment



Within program
after 5 years of
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Change in rubric dimension from year 1 to 4



● 4th year
● 1st year

Disseminating ideas from the workshop



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