

A decorative graphic on the left side of the slide, consisting of a dense cluster of small, semi-transparent blue squares and cubes that appear to be floating or falling from the top left towards the bottom left, creating a sense of motion and depth.

Trends and Futures in Continuous Improvement

Jake Kaupp



GACIP West Summit, June 15, 2018

2017-2018 has seen a lot of

change

engineerscanada



ingénieurscanada



ENGINEERING COMMUNITY

Comfortable with
**outcomes,
mapping &
assessment**

Solved the initial
problem of
collecting data

Understand that a
good process is a
long-term goal

Realize that the “**old**”
**accreditation
narrative** is **flawed**

Follow a self-determined
model for **continuing
support** of GA & CI
processes

looking for **guidance** in
making decisions
using data

interested in approaches
to **visualize**
assessment **data**

alignment of assessments
impacts **reliability &**
validity of data

managing **processes**
and supporting **people**
during **change**

CEAB

is moving to focus more on

PROCESS

and less on

DATA

HOW?





National Institute for
Learning Outcomes Assessment
Making Learning Outcomes Usable & Transparent

WABASH NATIONAL STUDY OF
Liberal Arts Education

We have learned that **measuring student learning** is by far **the easiest step** in the assessment process.

The real challenge begins in faculty, staff, administrators, and students at institutions **using the evidence to improve student learning.**

It is **incredibly difficult to translate assessment evidence into improvements** in student learning

It is far **less risky and complicated** to **analyze data** than it is to **act**



1 Defining

Program Objectives and Indicators

2 Mapping

the Curriculum

3 Collecting

the Data

4 Analysing

and Interpreting the Data

Sunshine and lollipops



Mordor



1. Changing our definition of using data

2. Aligned, Authentic Assessment

3. Visualizing Assessment Data

4. Supporting Meaningful Change

4 Analysing
and Interpreting the Data

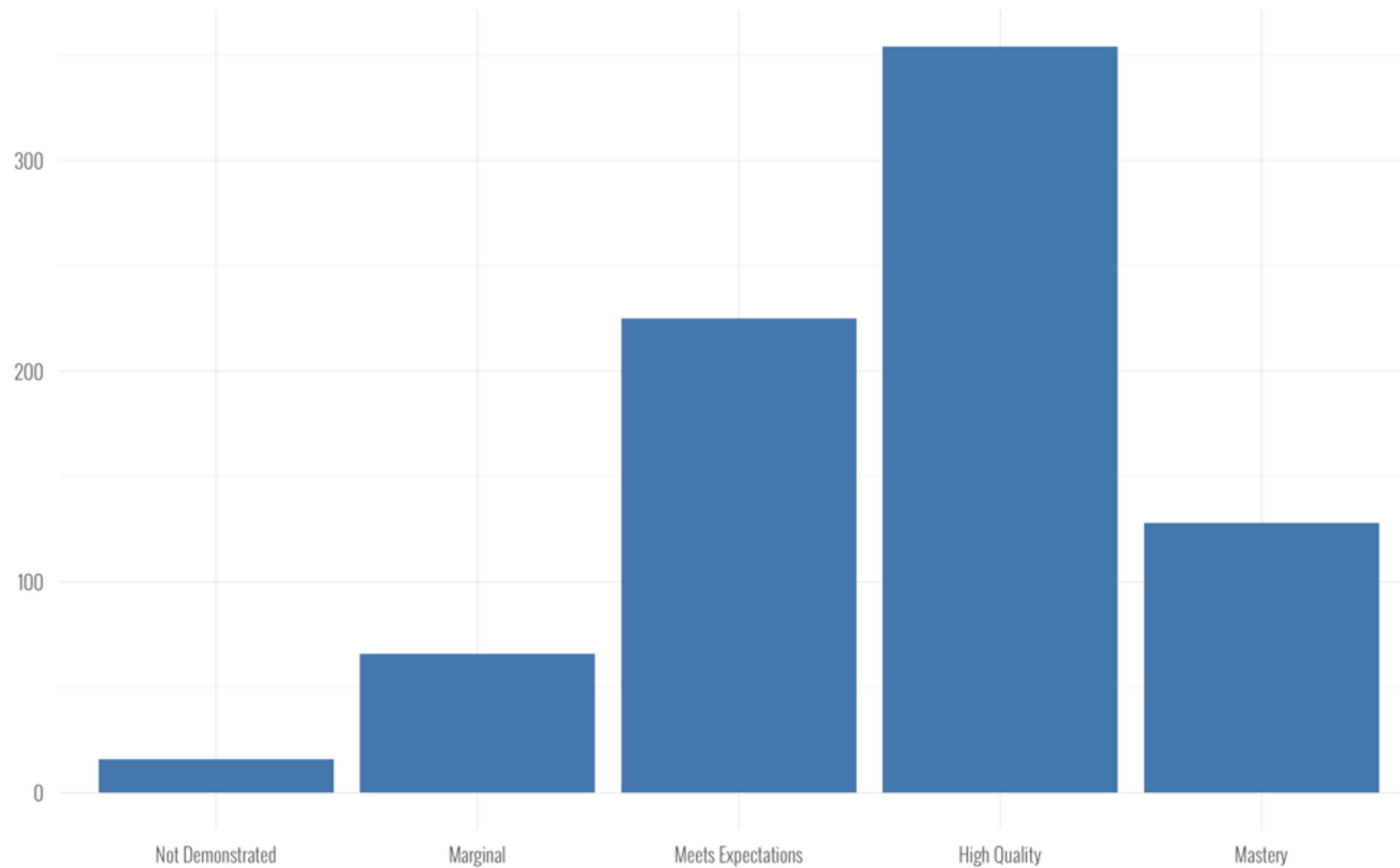
6 Managing
and Implementing Change

5 Improving
Curriculum and Processes

1. Changing our definition of using data

Histogram/Bar Chart of Student Performance

Number of students by performance level



Broadening Thinking about influence of data

“... 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.***”

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.

change our definition from

using data

to characterizing the

influence of data

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.

Note: The model definitions provided an existing code set for qualitative analysis of programmatic reports.

2. Aligned, Authentic Assessment

Trusting Data

VALIDITY: ON THE MEANINGFUL INTERPRETATION OF ASSESSMENT DATA

<https://doi.org/10.1046/j.1365-2923.2003.01594.x>

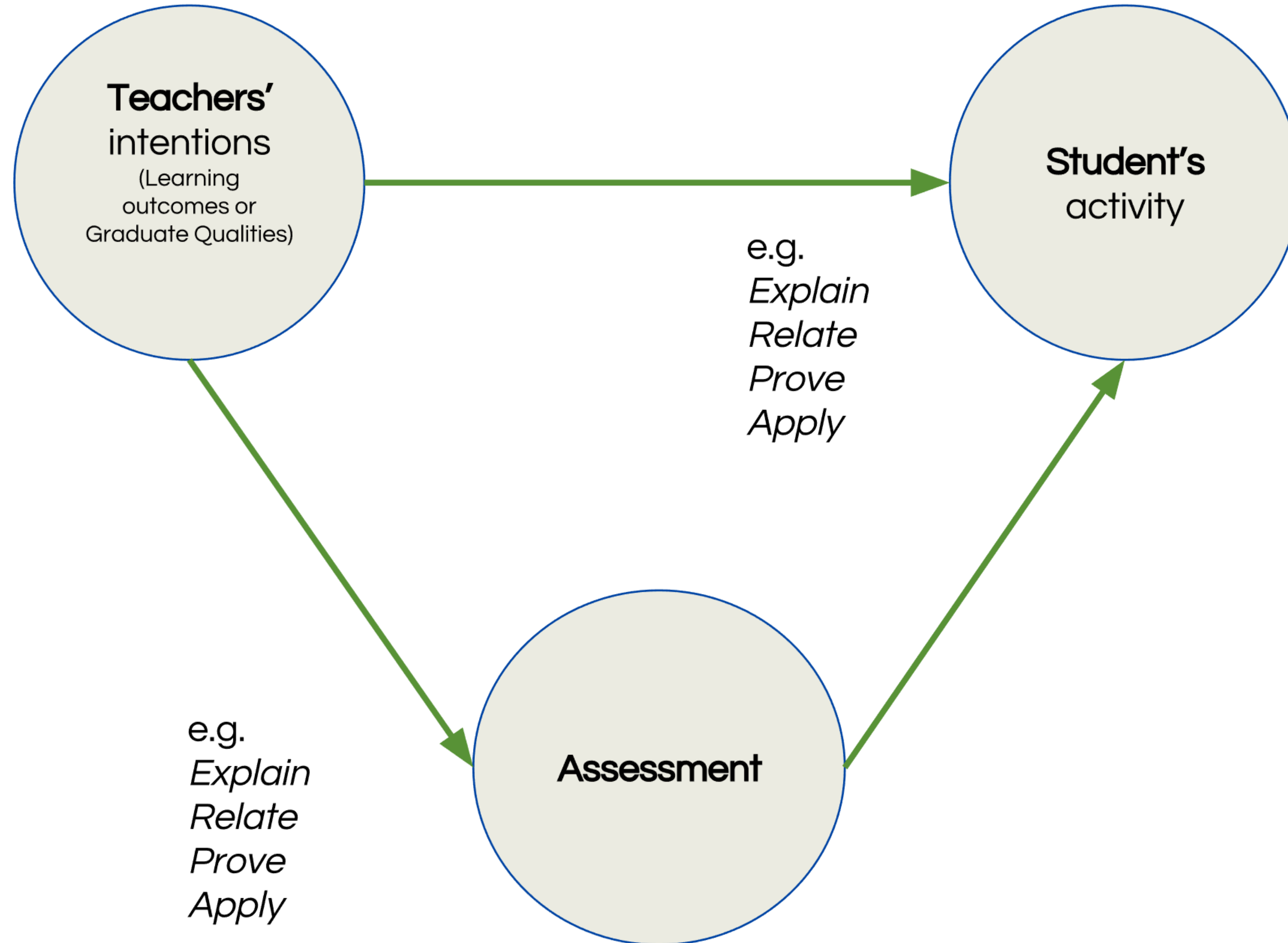
RELIABILITY: ON THE REPRODUCIBILITY OF ASSESSMENT DATA

<https://doi.org/10.1111/j.1365-2929.2004.01932.x>



ALIGNED COURSE

e.g.
Explain
Relate
Prove
Apply



Valid is it authentic?

Reliable is there training/calibration?

Accurate are performance levels reflective?

Precise are performance levels distinct?

Aligned does it reflect outcomes and learning activities?

3. Visualizing Assessment Data

Assessment data has **legs only if the evidence collected rises out of extended conversations** across constituencies about:

- (a) what **people hunger to know** about their teaching and learning environments, and
- (b) how the assessment **evidence speaks** to those questions.

— KEY THEMES —

SHOW THE ~~DATA~~

FACILITATE COMPARISON

AVOID UNNECESSARY ~~OR SUPERFLUOUS~~ ELEMENTS

Provide Context

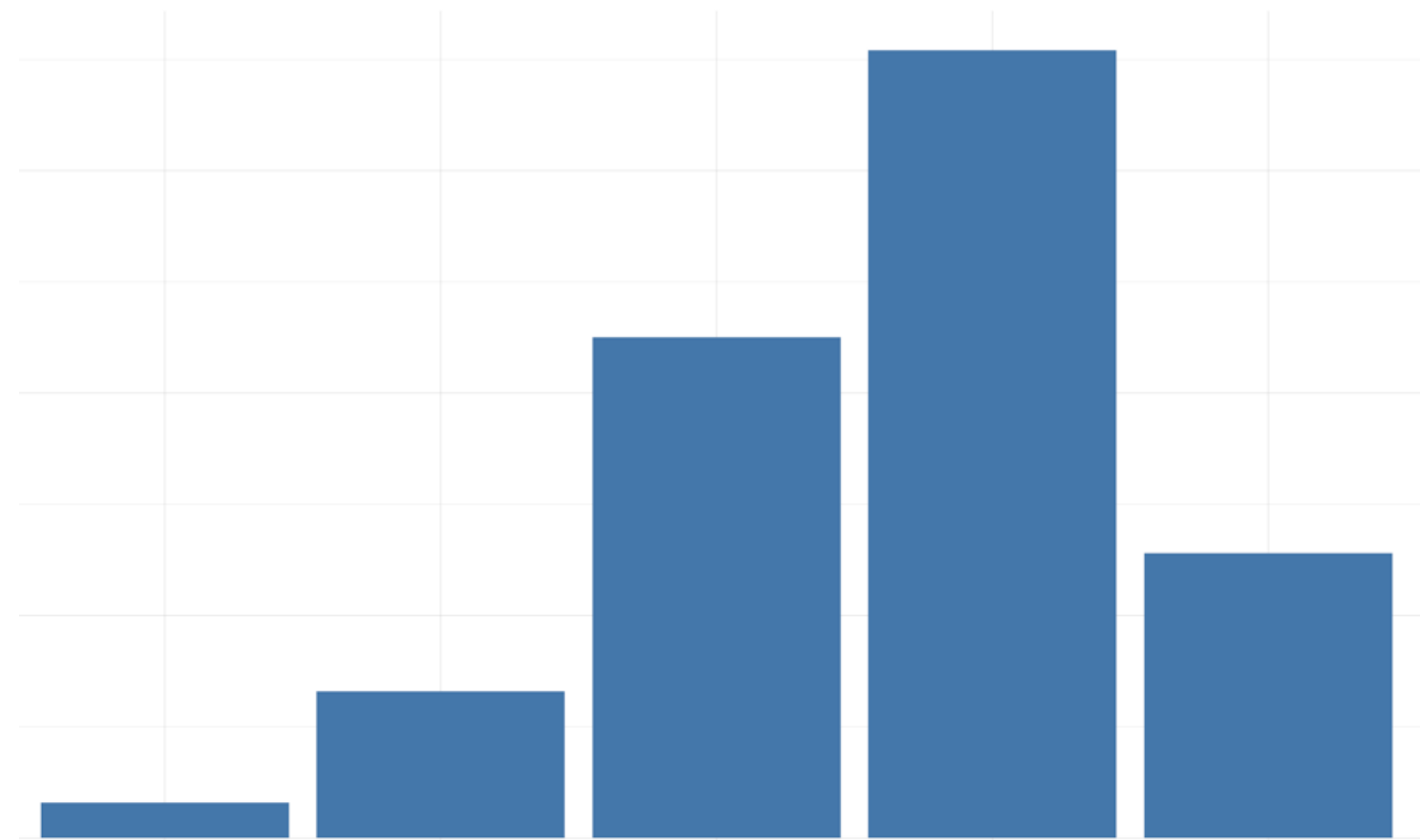
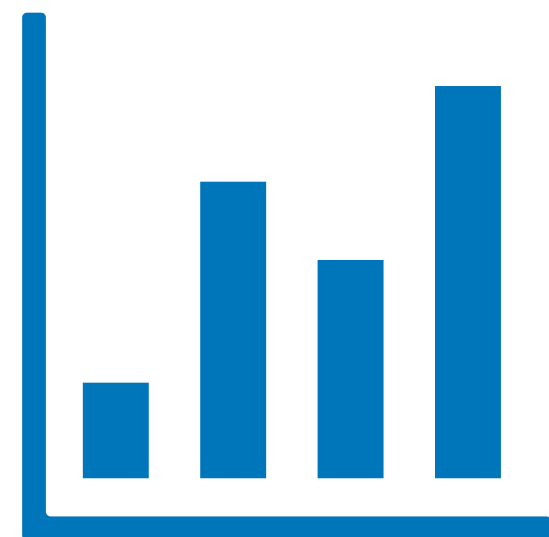
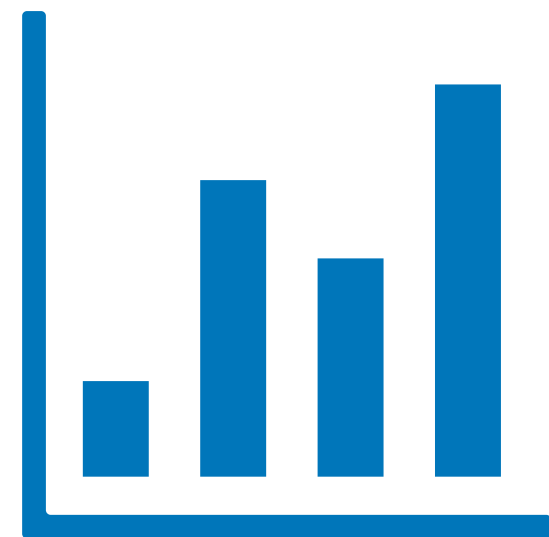
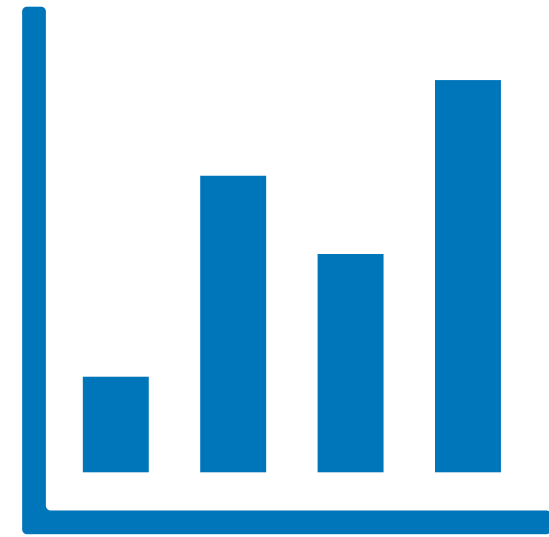
HAVE A **narrative**

— GOLDEN RULE —

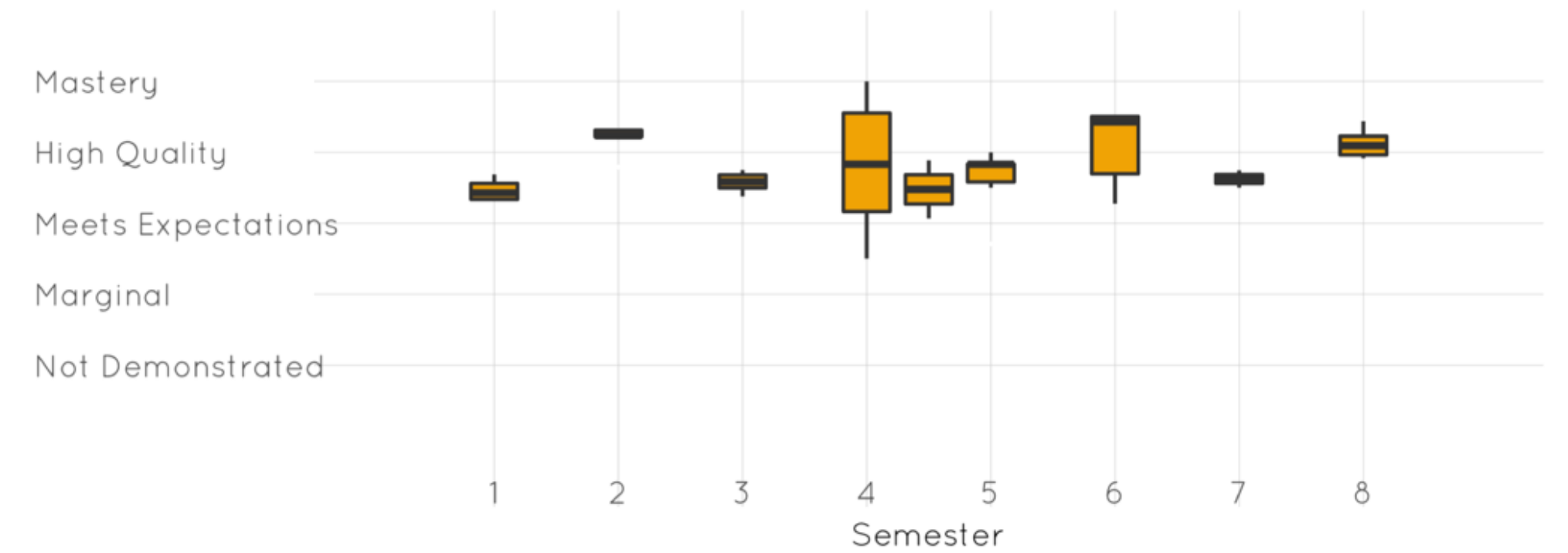
What's your point?



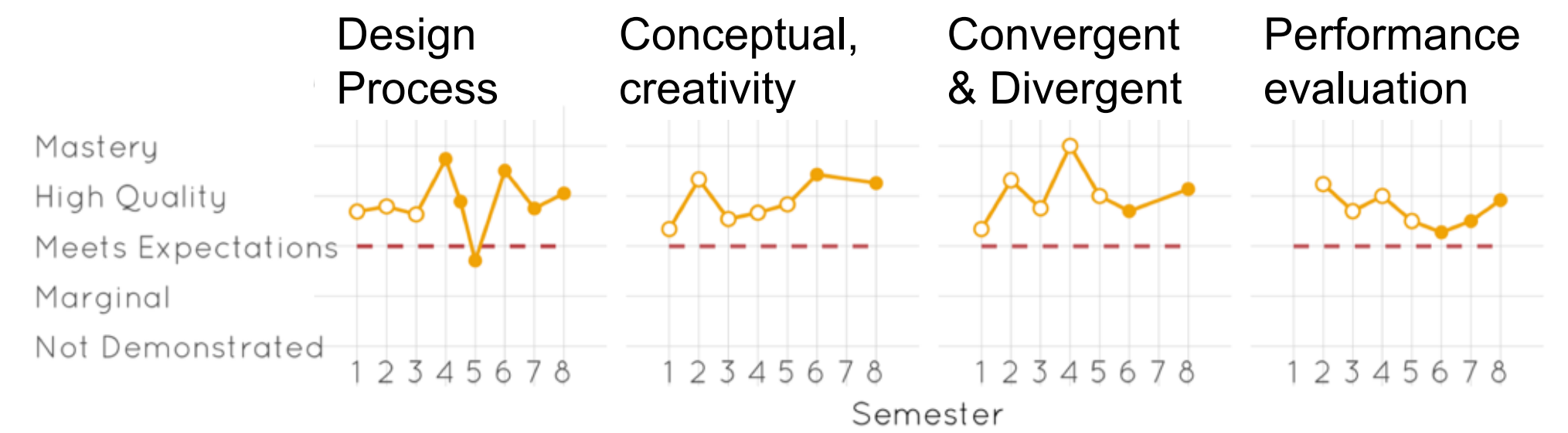
Aggregation is tricky



Design Overview



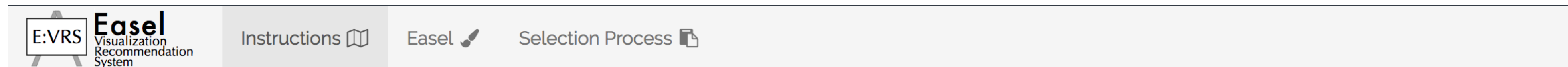
Samples of Design Indicators



Strive to show distributions or uncertainty



<http://shiny.engineering.queensu.ca/easel/>

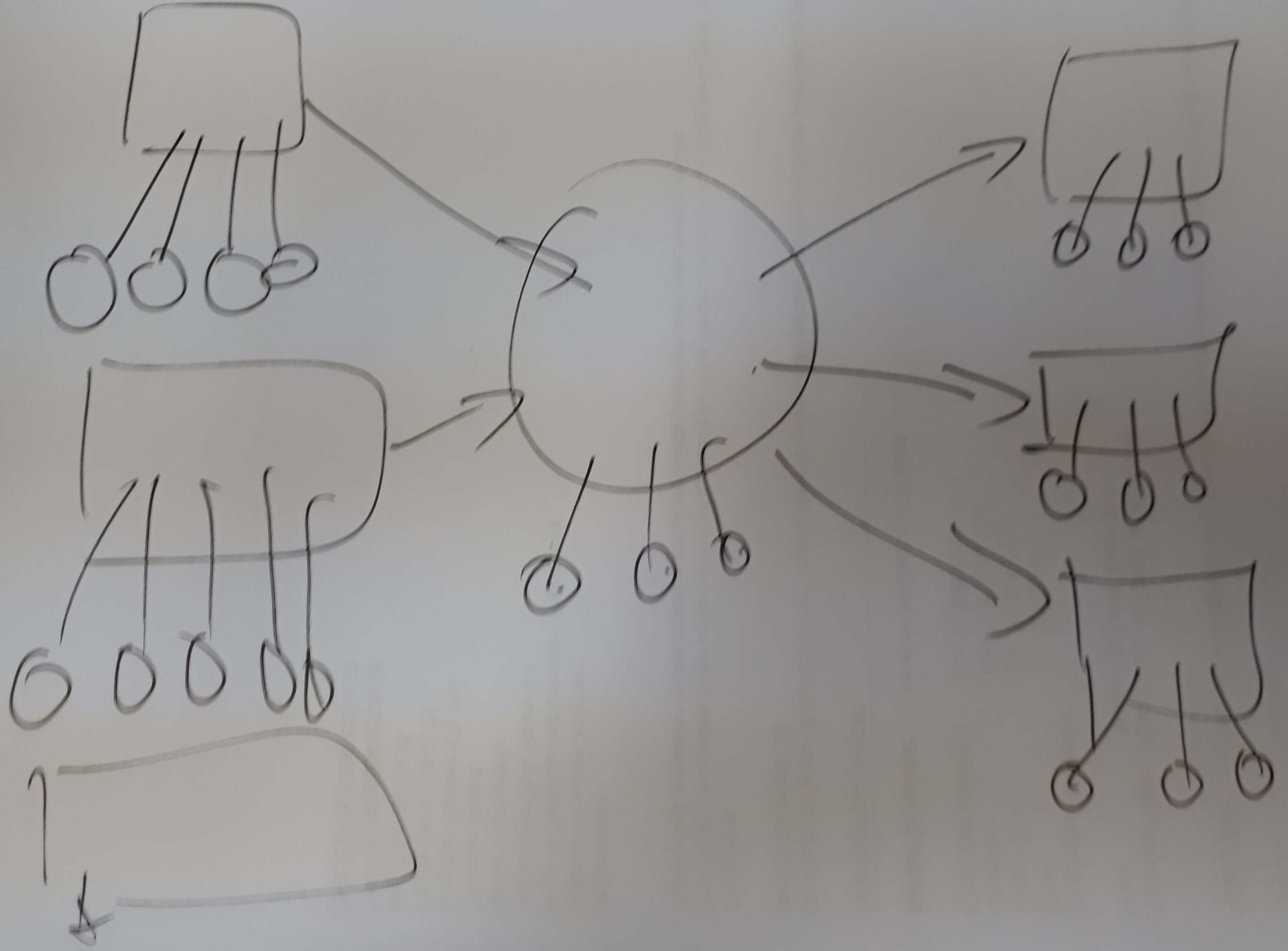


About Easel

Data visualization can be a powerful tool for analyzing and communicating data. However, the overwhelming diversity of options for visualization make it difficult to know how to most effectively visualize data given a specific task. Easel, a visualization recommendation system, was built in response to this problem, specifically for university educators and education support staff looking to improve their visualization techniques of educational data. Its purpose is two-fold:

- Guide a user towards well-formed questions regarding your educational data.
- Provide recommendations for visualizations that will help answer those questions.

The recommended visualizations were created using a design processes and principles outlined in visualization literature, largely from [Munzer's Visualization Analysis and Design](#). We repurposed a visualization selection methodology for the context of education, which can be found by clicking the Selection Process option above along with examples of its usage.



4. Supporting Meaningful Change

delve into your

culture

to understand and build your

value proposition

Culture

EATS

STRATEGY

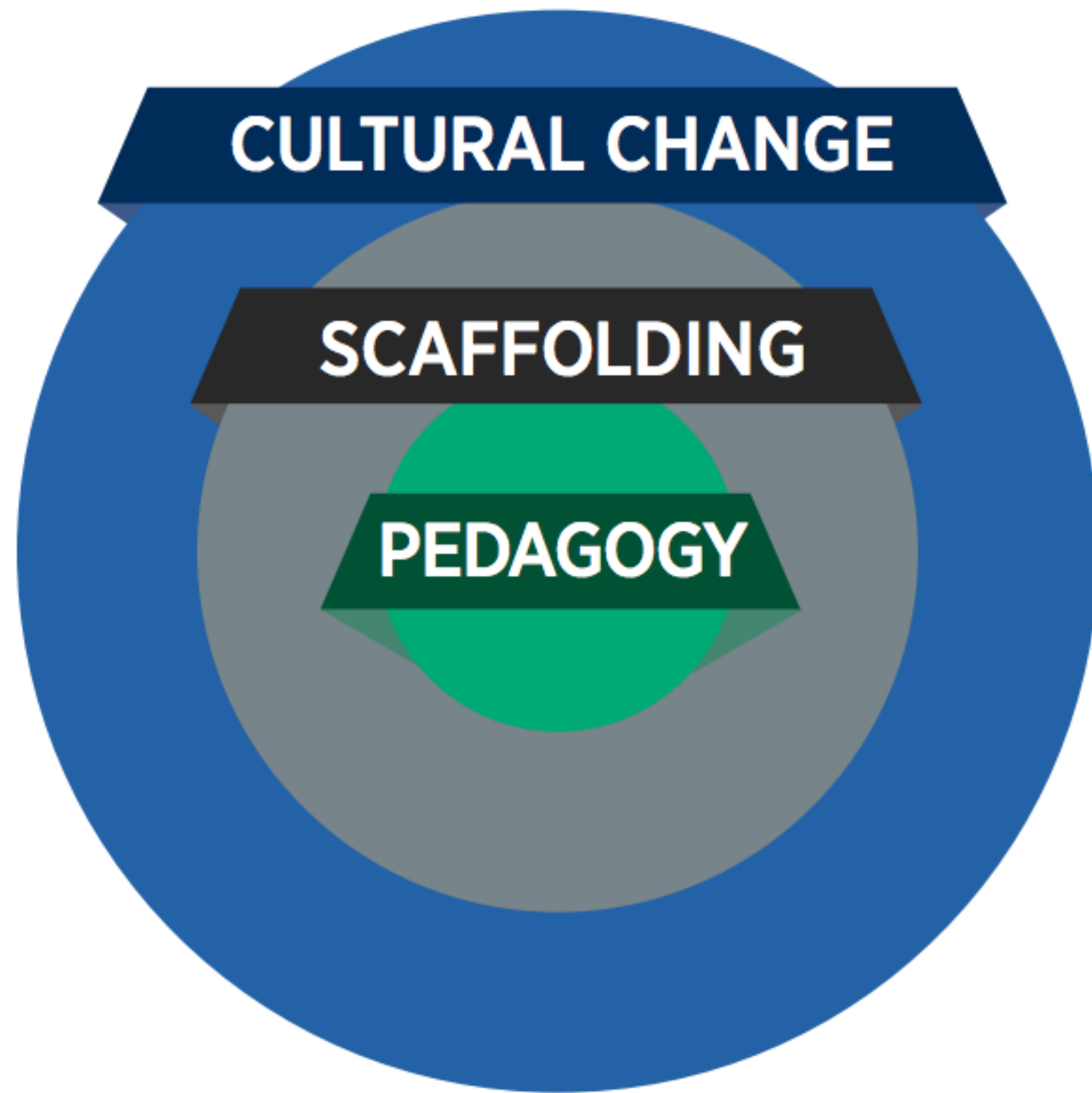
FOR BREAKFAST

- PETER DRUCKER -



Reframing Accreditation

Learn From Others



FRAMEWORK

FOR SYSTEMIC CHANGE IN UNDERGRADUATE
STEM TEACHING AND LEARNING

<http://bit.ly/2Aiy4CB>

Scale appropriately

Institutions will take at least **three to four years to make sense of and act on assessment evidence on one or two learning outcomes.** Yet we suspect this plan is overly ambitious.

Blaich & Wise

Cultivate Leadership

change literate &

implementation savvy

do

something

that

matters

something that matters



“for accreditation”



Positive program improvement
More skilled students
Happier faculty

No meaningful change
Wasted faculty time
Massive budget spend

