To draw **valid** conclusions we need **reliable** data.

Reliability of data relies on *consistency*, which can be measured as:

- Consistency over time
- Consistency between graders

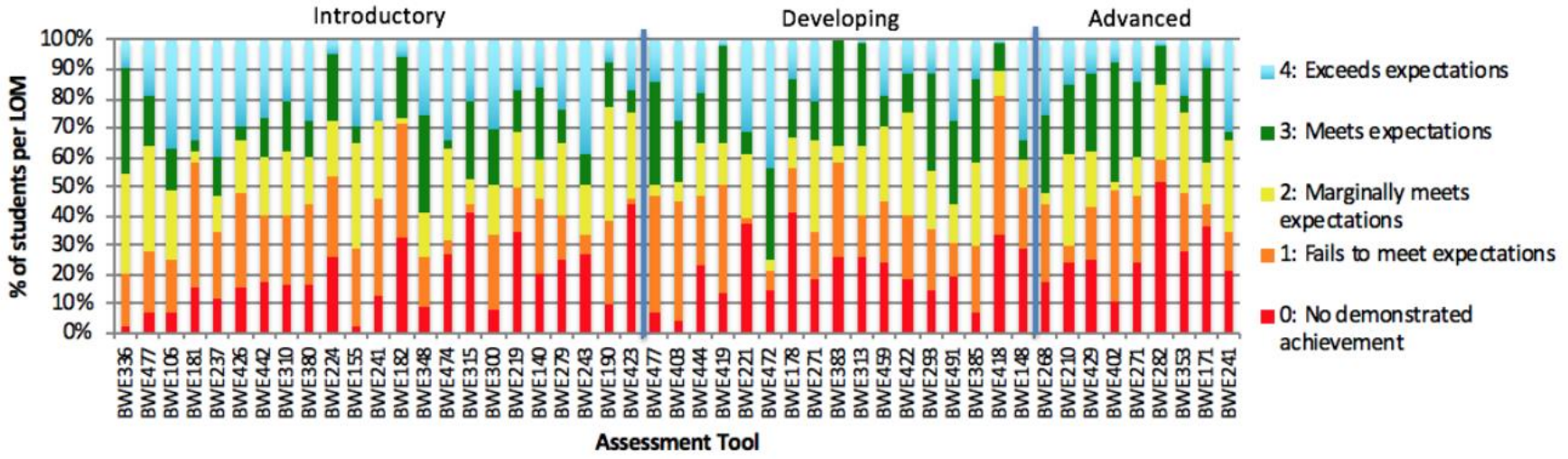
Validity of conclusions depends on:

- Measuring the right things (e.g. indicators)
- Using appropriate approaches to measure
- Agreement with conclusions drawn from other approaches (students, employers, alumni,…)
- Reliability

Let's use a framework for comparing aggregation approaches in Canada:

Factor	Possible options
Aggregation target	● single value (e.g. Design = 3.6/5) ● distribution of performance, (e.g. histogram of student performance) ● qualitative description (textual based analysis of results)
Aggregation level	● up to attribute (e.g. Design) ● up to indicator within each attribute (e.g. "Problem definition") ● up to task within indicator within attribute (e.g. "Capstone design report")
Differentiation factors	● Year of Program (Year 1 to 4) ● IDA level (Introduce, Developed, Applied) ● Program option (e.g. biomechanics vs. materials) ● Summative vs. Formative ● Assessment type (e.g. final report, exam, lab simulation, portfolio) ● Student groups (first in family, racialized, Indigenous)
Reliability measure	● Correlation between tasks (e.g. correlation between three measures of "problem definition") ● Correlation between years (e.g. correlation between scores in 2016, 2017, and 2018) ● Correlation between multiple ways of measuring an indicator

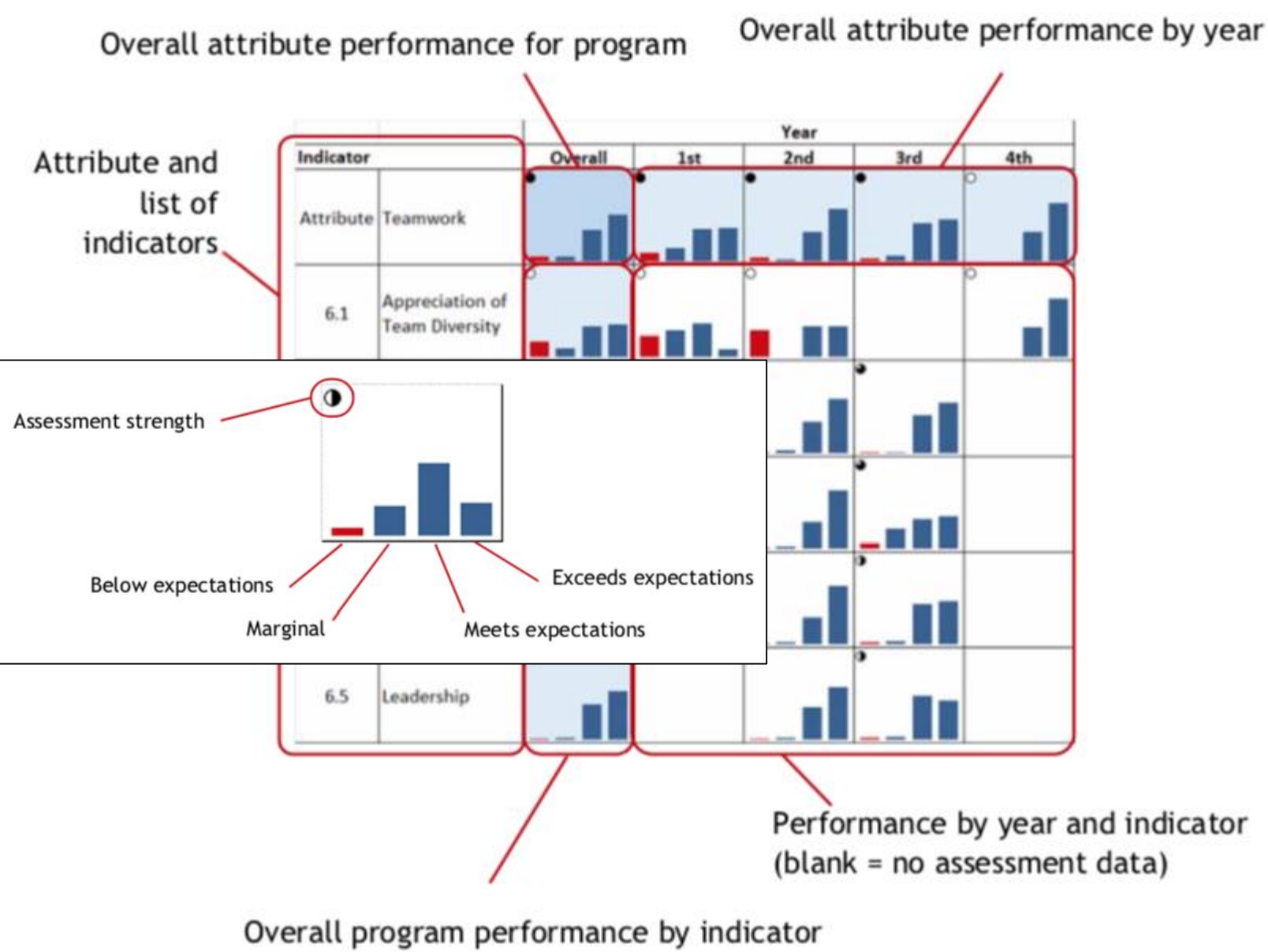
2a) Problem Analysis: Indicator (a)



Tool	Ind	Level	Assessor	Question or course learning outcome	# of students at LOM...					% of students over threshold
					0	1	2	3	4	
BWE336	a	I	1. Instructor	CLO #5 (Awesome assessment method #5)	7	47	88	93	25	45%
BWE477	a	I	1. Instructor	CLO #4 (Awesome assessment method #5)	18	54	93	44	50	36%
BWE106	a	I	1. Instructor	CLO #11 (Awesome assessment method #7)	14	35	45	27	71	51%
BWE181	a	I	1. Instructor	CLO #11 (Awesome assessment method #6)	27	75	8	6	60	38%
BWE237	a	I	1. Instructor	CLO #11 (Awesome assessment method #1)	25	46	26	28	83	53%
BWE426	a	I	1. Instructor	CLO #7 (Awesome assessment method #8)	43	91	49	15	82	35%
BWE442	a	I	1. Instructor	CLO #6 (Awesome assessment method #1)	37	48	44	27	57	39%
BWE310	a	I	1. Instructor	CLO #3 (Awesome assessment method #2)	61	87	81	65	77	38%
BWE380	a	I	1. Instructor	CLO #8 (Awesome assessment method #1)	37	63	35	29	61	40%
BWE224	a	I	1. Instructor	CLO #2 (Awesome assessment method #6)	95	99	72	80	19	27%
BWE155	a	I	1. Instructor	CLO #11 (Awesome assessment method #6)	3	41	54	8	44	35%
BWE241	a	I	1. Instructor	CLO #6 (Awesome assessment method #3)	35	93	72	1	75	28%
BWE182	a	I	1. Instructor	CLO #10 (Awesome assessment method #3)	77	89	6	47	14	26%

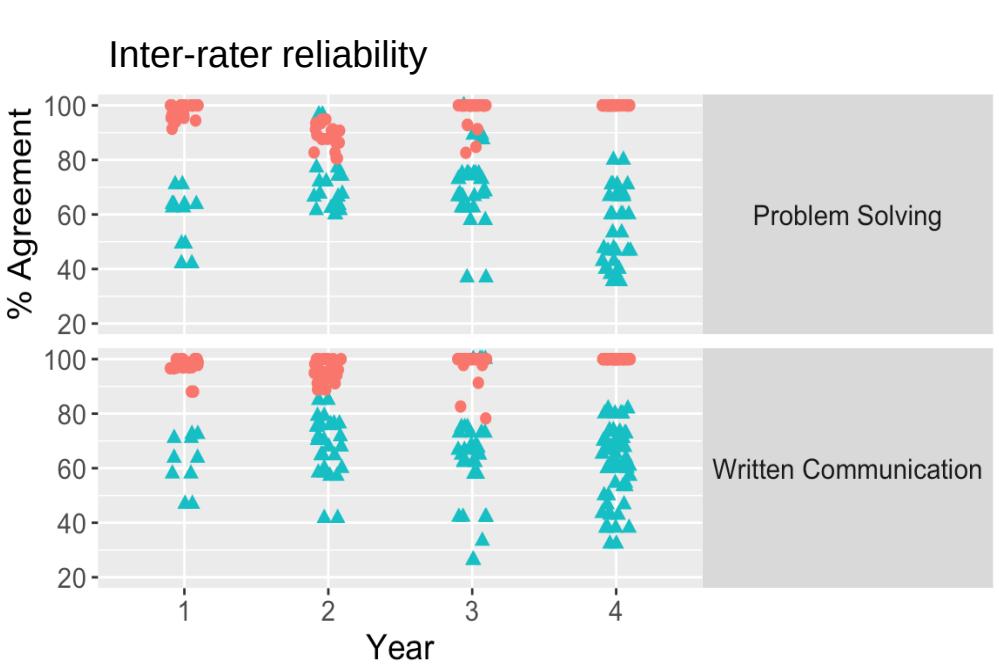
Factor	Approach
Aggregation target	Frequency distribution of performance
Aggregation level	Multiple (learning outcome within indicator)
Differentiation factors	IDA
Reliability measure	

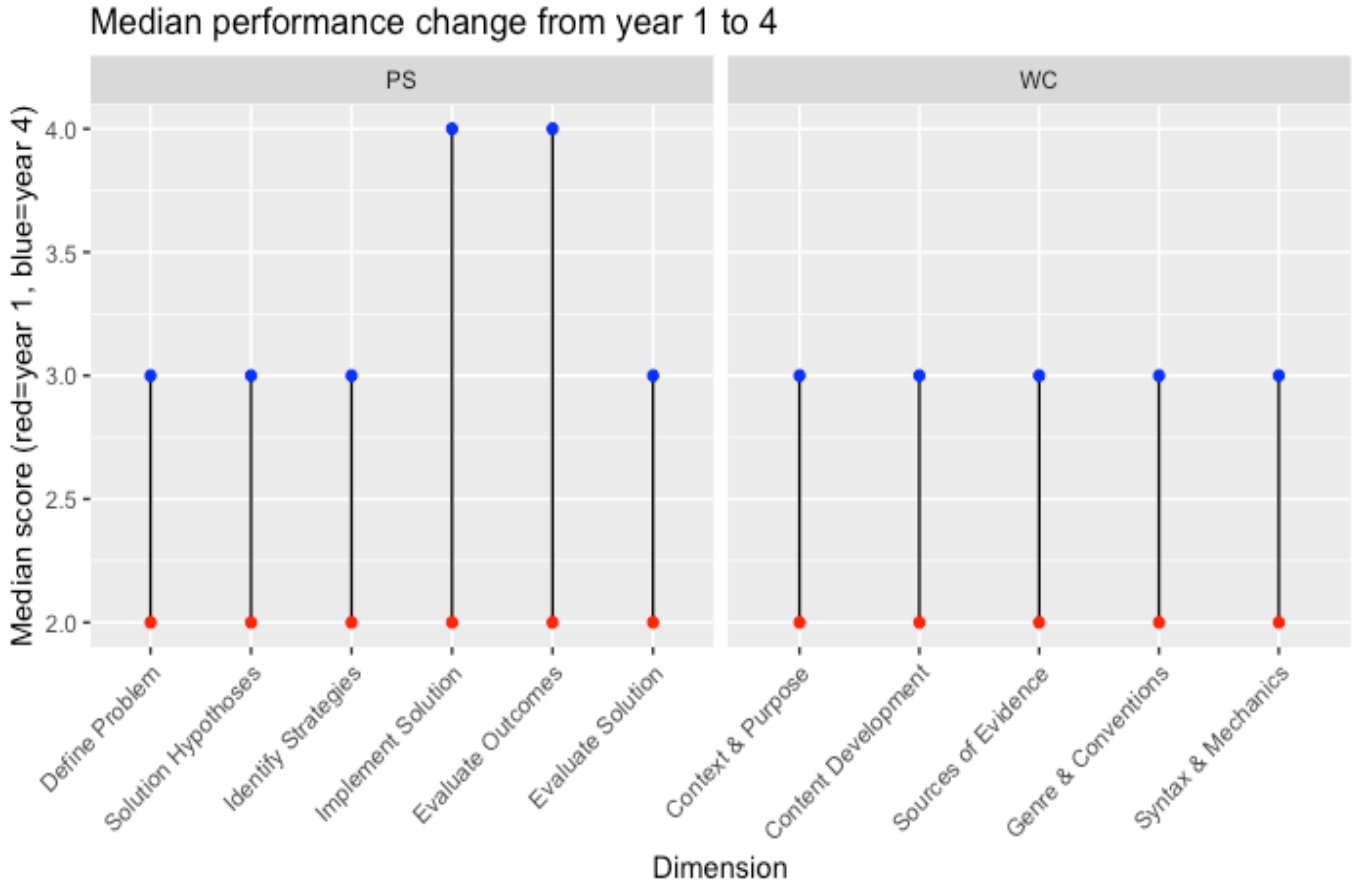
EXAMPLE 1



Factor	Approach
Aggregation target	Frequency distribution: of performance
Aggregation level	Indicator
Differentiation factors	Year
Reliability measure	“Assessment strength” rating by instructor

EXAMPLE 2





Factor	Approach
Aggregation target	Rubric dimension medians
Aggregation level	Indicator
Differentiation factors	Year level
Reliability measure	% agreement (Inter-rater reliability)