

International Assessment of Student Learning Outcomes Initiative: An Application of Pasteur's Quadrant

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Learning Outcomes: Evolution of Assessment

October 17, 2016 | Toronto



Pasteur's Quadrant:

Use-Inspired Basic Research (UIBR) in Tertiary Education

- Pasteur's Quadrant is from Pasteur's life narrative in which he developed the building blocks of micro-biology while trying to solve typhus.
- At historical junctures decisions created objective tools of analysis for agriculture, health and national security to be used for policy applications. All tools based on value system of science.
- Tertiary education should be next for UIBR. Our focus here is on international education assessment. Several fields are relevant to establishing an interdisciplinary approach---cognitive science, economics, data analytics, ed tech, teaching and learning.

Themes

- Justification of Initiative.
- What is CLA+ International? What is the plan for its evolution?
- An application of Pasteur's Quadrant.

The 3 Core Principles of the Initiative

- The test must be reliable and valid across national boundaries (see papers and monographs about reliability and validity of CLA+ at cae.org)
- The test results must be actionable:
 - Aligned with and lead to improvements in teaching and learning
 - Provide benefits for students, institutions, national consortia of institutions, and countries

Principle 3 Governance

- Participating countries, national consortia of universities, and institutions own their data.
- Students decide how to use their test data, including mastery badges.
- The advisory group, formed of representatives from participants, will recommend the content for new tests to internationalize the CLA+ International protocol and new forms of tests to use are appropriate.

The Case for Assessment of Student Learning

- Postsecondary institutions are too important and too fragile **Not** to provide the best objective tools of analysis to assist them in becoming more effective and efficient.
- We have a system based on peer review to measure the quantity and quality of research that researchers, universities and research facilities create. We also need a system of continuous improvement for teaching and learning.

The Rationale

- National leaders want to know how well their universities are preparing their students for the Knowledge Economy.
- Faculty and administrators want to know how to improve their teaching and learning.
- Students want credible, third-party evidence of their skill levels attained to show potential employers.
- Employers want credible evidence of the skill levels job applicants have.

Why Generic Skills Should Be the Focus for CLA+ International

- It is the strongest way to effectively and efficiently obtain reliable and valid comparable test results that are actionable for all the parties noted here.
- Without the ability to compare between institutions and across nations all stakeholders noted remain isolated with no ability to interpret how well they are doing in comparison to their counterparts.
- Other existing or projected international education assessment projects do not now permit comparisons in a reliable or valid way. Disciplines promising but will take time.

CLA+ International Protocol

- It is a **90 minute** test that requires the student to demonstrate their generic skills.
- It features a,
 - **Performance Task**, a real world problem, that is document based requiring an open ended response (60 minutes)
 - **25 Selected-Response Questions** (30 minutes)
 - Measures six subscores

CLA+ International

- Measures six sub scores:
 - Analysis and Problem Solving (APS)
 - Scientific and Quantitative Reasoning (SQR)
 - Critical Reading and Evaluation (CRE)
 - Critique an Argument (CA)
 - Writing Effectiveness (WE)
 - Writing Mechanics (WM)

Rationale for OECD/CAE Initiative

- OECD is the hub for international comparative assessments such as PISA and PIAC.
- Solutions for methodological issues encountered in AHELO developed,
 - Random sampling approach not practical for colleges but a representative sample is possible.
 - Moderate stakes are needed to motivate students to take the test and do their best on it.
 - Cross-national differences in levels of scoring difficulty can be equated.

CLA+ Analytics Provides Actionable Test Results

Education technology based tool comprised of three sections,

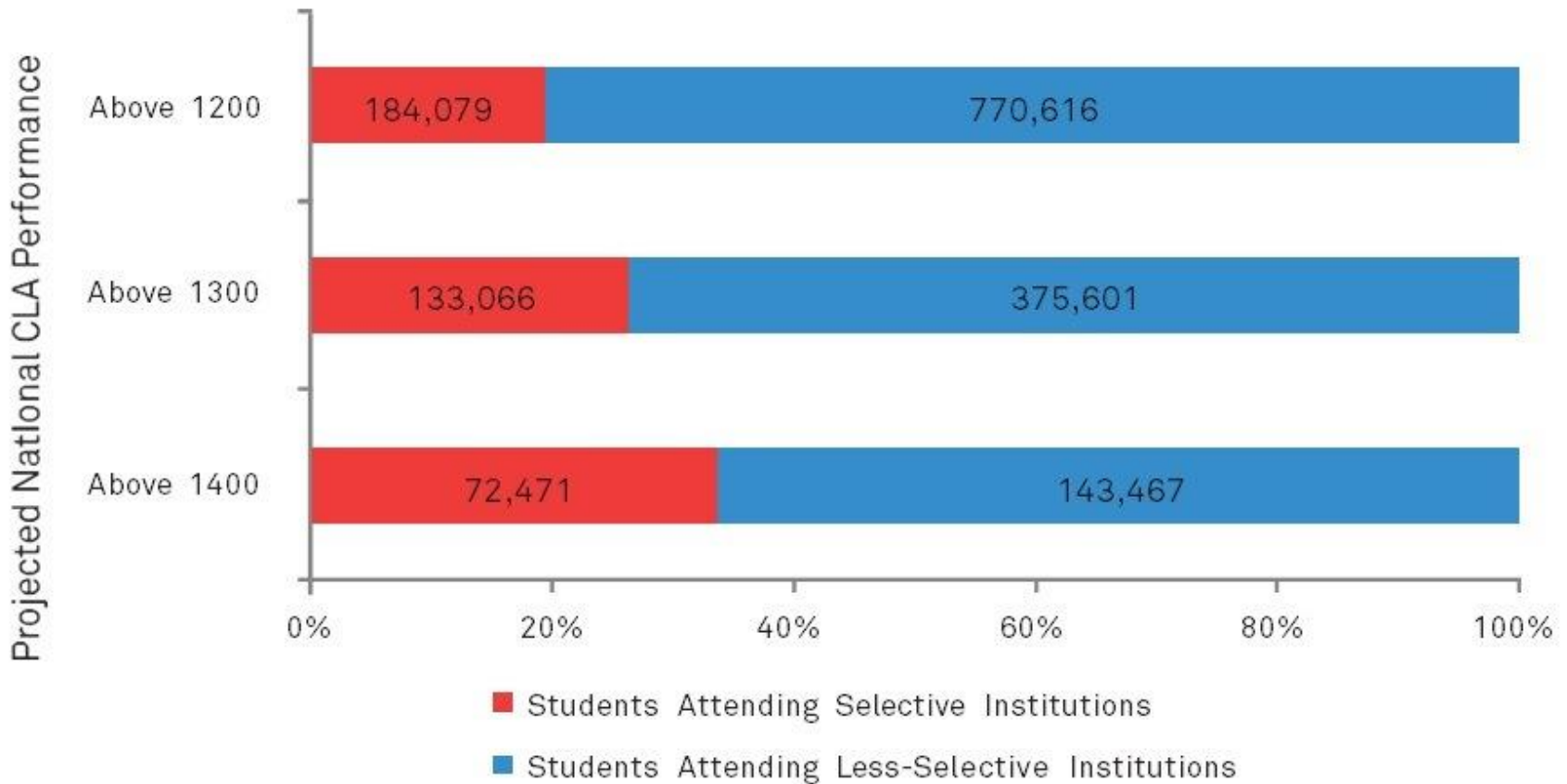
- **CLA+ Career Connect:** certified mastery level badges that provide students with credible information about the generic skill levels they have achieved
- **CLA+ Education:** provides information resources for students and faculty, suggesting ways to improve their generic skills
- **CLA+ Analytics:** provides assistance for advanced data analysis of test results and their use in policy analysis.

Two Evidence-based Applications of Pasteur's Quadrant---UIBR (Use inspired basic research)

Proportion of Selective vs. Less-selective Institutions (USA)

	Colleges & Universities		Student Enrollment	
	1980	2012	1980	2012
Selective	143 (5%)	143 (5%)	762,248 (12%)	940,771 (9%)
Less Selective	3,014 (95%)	3,014 (95%)	5,584,841 (88%)	9,823,718 (91%)
ALL	3,157 (100%)	3,157 (100%)	6,347,089 (100%)	10,764,489 (100%)

Projected National CLA Performance



Geographic Distribution of Selective and Less-selective Colleges



Test Administration in Italy

- 12 Universities (4 North, 4 Center, 4 South)
- 5,853 students
- Test Administration: April – May 2013
- Scoring: June – July 2013
- Analysis: September – December 2013
- Final Report: January 2014

60-minute PT & 20-item SRQ Comparison

Table 3. Descriptive statistics for the CLA+ for Italian vs. American students

		n	Mean	St. Dev	Percentiles		
					25 th	50 th	75 th
Total Scale Score	Italian Students	5853	1000	200	884	1016	1119
	American Students	4380	999	199	856	1007	1142
PT Scale Score	Italian Students	5853	1000	200	852	989	1124
	American Students	4380	1067	203	937	1070	1159
SRQ Scale Score	Italian Students	5853	1000	200	908	1048	1119
	American Students	4380	796	152	681	803	884

Interpretation

- Italian students' performance was comparable to their American counterparts with some differences at the Selected Response level due to the fact that different skills are required.
- Italian performance differed based upon Region (north, center, south).
- Italian employers found students' Teco results correlated higher with their judgments about the skill levels of the students they interviewed for jobs than the GPA of the students.

Next Steps:

1) Conference on Evidence-based Policy Applications

Conference on evidence-based policy applications from existing international assessments planned for January 2017,

- Leveling the playing field from college to career, US and Italy
- Predictive validity of test results
- Mexican-based analysis of AHELO results
- Importance of CLA+ Analytics for French Tertiary sector
- KokoHs German project
- Policy effects of learning gains project in England

Next Steps:

2) Implementation of OECD/CAE Initiative

First test administration planned for fall 2017-spring 2018.
To be announced in late winter 2016,

- Four to six countries planning to test with six set as the upper limit for this initial test administration
- 3 national consortia of private colleges and universities plan to test and a fourth national consortia possible