**The Importance of Measuring and Improving Higher Education Students' Generic Skills Internationally**
Doris Zahner[1] & Dirk Van Damme

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**Introduction**
Higher education today has become the most important route for the human capital development of a country as well as for upward social mobility of an individual. On average across the 38 countries that constitute the Organisation for Economic Co-Operation and Development (OECD) in 2021, 45% of the 25-to-34-year-old cohort had obtained a tertiary education qualification in 2020, compared with 37% in 2010 (OECD, 2021). The prognosis based on current trend data is that by 2030, there will be over 300 million 25-to-34-year-olds with a tertiary qualification in OECD and G20 countries, compared to 137 million in 2013 (OECD, 2015). Many countries have seen steep increases in their tertiary education enrollment and graduation figures. And emerging economies such as China, India, or Brazil see investments in the expansion of higher education as an important route toward economic growth and social progress.

However, there is a general question about the value of higher education degrees. Do they still signal a high level of advanced cognitive skills? Is massification leading to degree inflation and, hence, a decreasing intrinsic value of qualifications? The difficult answer to these questions is: we do not know. In contrast with secondary school systems, where OECD's Programme for International Student Assessment (PISA) has become the global benchmark of learning outcomes of 15-year-old students and hence of the quality of school systems, there is no global valid and reliable measure of the learning outcomes of higher education students and graduates. Indirect measures of the value of a higher education qualification, such as the employment rates or earnings of graduates, to a large degree are distorted by labor market polarization and substitution effects and are increasingly seen as unsatisfactory.

Attaining a higher education degree is only the first step. Once students graduate, their next challenge is to find a career that leverages their knowledge, skills, and abilities, and both students and employers are concerned that institutions are not preparing students with the skills necessary for future success (United Nations Educational, Scientific and Cultural Organization [UNESCO], 2021). When graduates are unable to find appropriate employment, the impact is immense for students, their parents, and their institutions. As of December 2020, 40% of recent higher education graduates in the United States were underemployed—that is, they were working in jobs that typically do not require a higher education degree—impacting their personal financial health and that of the broader economy (Federal Reserve Bank of New York, 2020).

It is essential for institutions of higher education to acknowledge, understand, and address the existing globally identified skills gap and mismatch (Montt, 2015; World Economic Forum, 2016) and prepare students for the world of work. Specifically, generic skills such as critical thinking, problem solving, and communication are the abilities that hiring managers value most (Hart Research Associates, 2013). More

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[1] Council for Aid to Education, Inc.

than content knowledge, these are the skills that can help students entering higher education achieve better outcomes, such as a higher cumulative GPA during their college tenure (Zahner et al., 2012, 2020). However, these essential skills are often not explicitly taught as part of the curricula in higher education, nor are they reflected on a transcript. While content knowledge is a requisite part of a student's education, it alone is insufficient for a student to thrive academically and professionally (Capital, 2016; Hart Research Associates, 2013; Rios, et al., 2020; World Economic Forum, 2016).

**Assessing Generic Skills**
The voice of employers, concerns about graduate employability, and the growing interest in generic skills certainly have influenced curriculum development, course design, and teaching and learning practices in higher education institutions. Three dimensions seem to be important in the current educational reform in higher education (Zahner et al., 2020): the shift from the long-standing lecture format to a student-centered approach emphasizing students' active class participation, the change in the balance of curricular and textbook focus from its current emphasis on content to case- and problem-based materials requiring students to apply what they know to novel situations, and the innovation in assessment instruments from multiple-choice tests that are best used for measuring the level of content absorbed by students to open-ended assessments that are aligned with several goals of the reform initiative.

Although many higher education institutions and systems have made significant advances on the first two dimensions of this education reform movement, assessment has lagged behind. As universities focus increasingly on developing generic skills in their students, assessments need to evolve to measure how well students are learning—and institutions are teaching—such skills. Multiple-choice and short-answer assessments remain the dominant testing regime, not only for facts, but also for generic skills. As a result, the testing regime is not assessing the most critical skills required of students in the workplace and—just as importantly—is not supporting the other two dimensions of reform. The promise of educational reform developing in today's knowledge economy cannot be achieved without employing open-ended, performance-based assessments.

An important advantage of performance-based assessments is that they are seen as tests worth teaching to. The practice of "teaching to the test" for performance-based assessments should be encouraged. That is, class time spent preparing students to apply knowledge as well as analysis and problem-solving skills to complex, real-world problems is time well spent. If performance-based assessments are integrated into accountability systems, this has the potential to positively impact classroom practice by encouraging teachers to foster the development of competencies in generic skills. This effect has yet to be established, so it would be worthwhile to investigate whether the introduction of performance-based assessment for accountability purposes has the desired effect on teaching and learning. One potential barrier to investigate is the perceived level of effort required to use performance-based assessments regularly in the classroom.

Additionally, a critical shortcoming of today's principal educational assessment regime is that it pays little attention to how much an institution contributes to developing the competencies students will need after graduation. For instance, the outcomes that are typically looked at by higher education accreditation arrangements, such as an institution's retention and graduation rates and the percentage of its faculty in tenured positions, say nothing about how well the school fosters the development of its students' analytic reasoning, problem-solving, and communication skills. This situation is unfortunate because the ways in which institutions are evaluated significantly affects institutional priorities. If institutions were held accountable for student learning gains and student achievement, they would

likely direct greater institutional resources and effort toward improving teaching and learning. Assessment has an enormous potential for driving change.

**Developments in Assessing Higher Education Learning Outcomes**
Over the past decades, several research initiatives and experimental programs to assess the learning outcomes of students in higher education have been initiated (Blömeke et al., 2013; Coates, 2016; Coates & Zlatkin-Troitschanskaia, 2019; Douglass et al., 2012; Hattie, 2009; Wolf et al., 2015).

An overview of the field identified innovative assessment practices in multiple countries (Nusche, 2008):
- In the USA, the Council for Aid for Education (CAE) has developed the Collegiate Learning Assessment (CLA) and its more recent variant CLA+ (Klein et al., 2007).
- The University of California has developed the Student Experience in the Research University Survey.
- The testing company Educational Testing Service (ETS) has developed the "HEIghten™ Outcomes Assessment Suite" (Liu et al., 2016).
- The European Commission, through the Tuning initiative, has endorsed the Comparing Achievements of Learning Outcomes in Higher Education in Europe (CALOHEE) project (Wagenaar, 2019).
- Germany has initiated a large and cross-disciplinary study for modeling and measuring competencies in higher education (KoKoHs) (Blömeke et al., 2013).
- In the UK, the "Teaching Excellence Framework" has included several projects toward the assessment of learning outcomes in universities.

Based on the demand from employers who hire graduates from higher education (Capital, 2016; Hart Research Associates, 2013; Rios, et al., 2020; World Economic Forum, 20160, it is probable that many more national and local initiatives will emerge. This paper focuses on the CLA+ and its use for measuring students' generic skills and their learning gains throughout their tenure in higher education.

**Generic Skills: Critical Thinking and Written Communication**
Fact-based knowledge is no longer sufficient for success in higher education and career. Students need the essential skills of critical thinking, problem solving, and written communication to achieve their full potential. By improving their essential skills, students can increase the likelihood of success in higher education and beyond. Assessments such as CLA+ can be used to measure and improve students' generic skills.
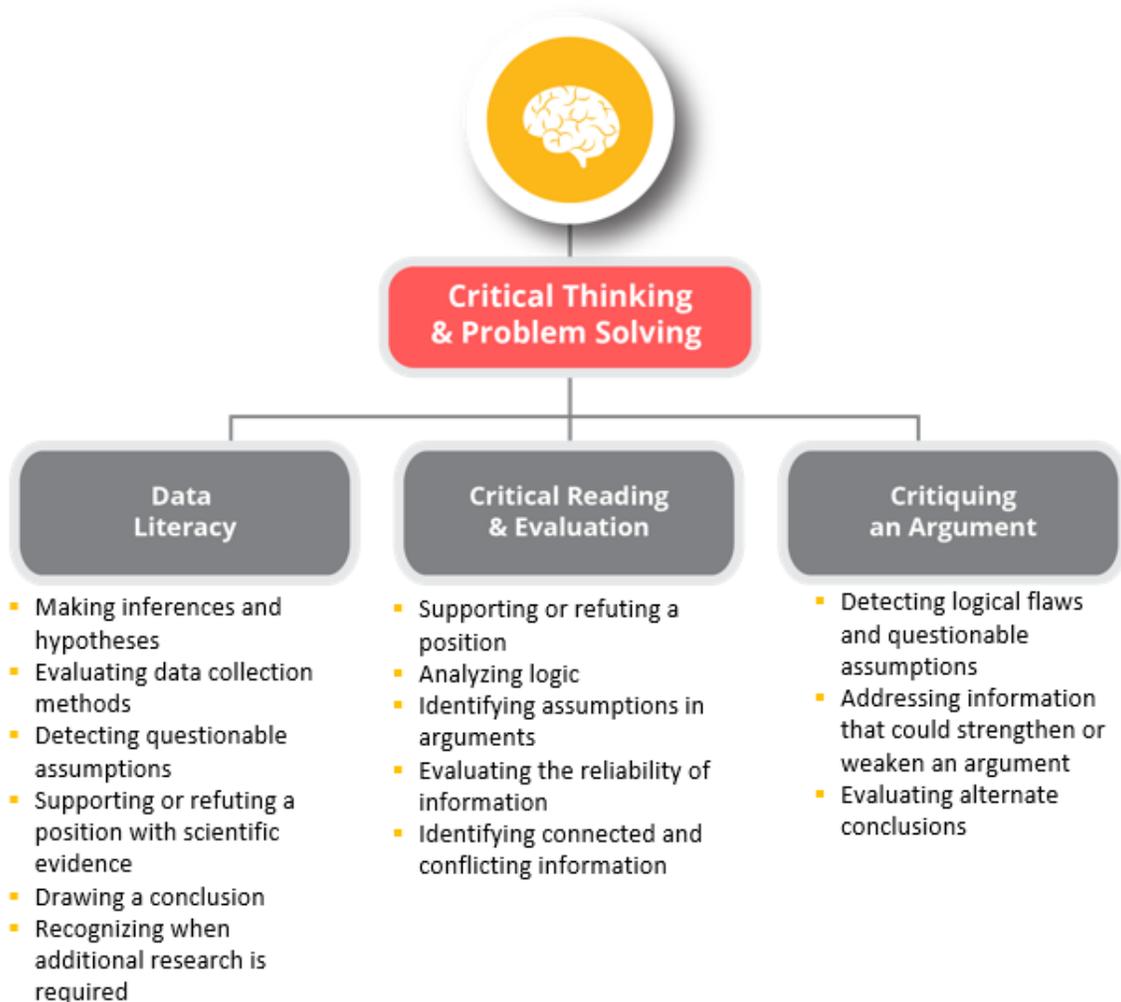
To assess how students perform in situations requiring essential generic skills, students should be situated in real-world scenarios that require purposeful written or oral responses. Students should be asked to address important issues, propose solutions to problems, and recommend courses of action to resolve conflicts. They should be able to support their decision or recommendation by utilizing information they would encounter on the job such as reports, data tables, newspaper or peer-reviewed articles, office memoranda, and other sources of information with varying amount of information bias.

The CLA+ focuses on critical thinking and problem solving, more specifically, data literacy, critical reading and evaluation, and the ability to critique arguments (Figure 1)—skills that are increasingly relevant in a diverse world where the ability to clearly perceive, integrate, and critique opposing viewpoints is essential. As in the real world, there is seldom a single "correct" answer, and students' responses should reflect a range of plausible and effective strategies—a process that, by design, mimics real-world, complex decision environments. Students are challenged to

- analyze and understand data;
- evaluate the credibility of various documents;
- identify questionable or critical assumptions;
- deal with inadequate, ambiguous, and conflicting information;
- identify additional information that would help resolve issues;
- construct an organized and logically cohesive argument by providing elaboration on facts or ideas (e.g., explaining how evidence bears on the problem, providing examples, and emphasizing especially convincing evidence);
- organize and synthesize information from several sources; and
- marshal evidence from different sources in a written response.

**Figure 1**
*CLA+ Critical-Thinking and Problem-Solving Skills*



Critical Thinking & Problem Solving

**Data Literacy**
- Making inferences and hypotheses
- Evaluating data collection methods
- Detecting questionable assumptions
- Supporting or refuting a position with scientific evidence
- Drawing a conclusion
- Recognizing when additional research is required

**Critical Reading & Evaluation**
- Supporting or refuting a position
- Analyzing logic
- Identifying assumptions in arguments
- Evaluating the reliability of information
- Identifying connected and conflicting information

**Critiquing an Argument**
- Detecting logical flaws and questionable assumptions
- Addressing information that could strengthen or weaken an argument
- Evaluating alternate conclusions

Additionally, CLA+ measures students' written communication skills through their response on the performance-based assessment.  The assessment measures how well students can craft a response to the problem and communicate effectively (Figure 2).

**Figure 2**
*CLA+ Written Communication Skills*



**CLA+ International Data (VanDamme & Zahner, In preparation)**
In 2008, mandated by a decision of education ministers gathered in Athens in 2006, the OECD embarked on the Assessment of Higher Education Learning Outcomes (AHELO) Feasibility Study (Coates & Richardson, 2012; Ewell, 2012). The study, which lasted to 2013, was the first international initiative for the assessment of higher education learning outcomes and involved 248 higher education institutions and 23,000 students in 17 countries or economies. It included a generic skills strand, for which the CLA instrument was used, and two discipline-specific strands (engineering and economics). The results, outcomes, and experiences were reported in three volumes (OECD, 2013a, 2013b; Tremblay et al., 2012). The main conclusion of the AHELO Feasibility Study was that an international assessment of students' learning outcomes, which some people referred to as "a PISA for higher education," was feasible, despite considerable conceptual, methodological, and implementation challenges.

Using the lessons learned from the AHELO Feasibility Study (Dias and Amaral, 2014; Ewell, 2012; Lalancette, 2013; Tremblay, 2013; Wolf & Zahner, 2015; Wolf et al., 2015), CAE and the OECD executed a Memorandum of Understanding (MOU), which allowed the two organizations to continue collaborating on assessing higher education students' generic skills. The intent of the MOU was for the collaboration between the OECD Directorate for Education and Skills and CAE to enable tertiary

education institutions and jurisdictions to develop and implement innovative performance-based assessments to measure the generic skills of higher education students.

As a result of this collaboration, between 2015 and 2020, CLA+ was administered internationally to higher education students in six countries (Table 1). All countries participated in multiple administrations of the CLA+.

**Table 1**

*Sample by Country and Year of Study*

| Country | Entering | Exiting | Total |
|---|---|---|---|
| Chile | 2,387 | 568 | 2,955 |
| Finland | 1,469 | 831 | 2,300 |
| Italy | 0 | 6,589 | 6,589 |
| Mexico | 6,551 | 2,039 | 8,590 |
| United Kingdom | 2,086 | 155 | 2,241 |
| United States | 50,809 | 47,431 | 98,240 |
| Total | 63,302 | 57,613 | 120,915 |

Results from the CLA+ international database indicate that there is indeed improvement in students' generic skills between the time they enter higher education and when they exit (Figure 3). (The students from the Italian higher education institutions were not included in the analysis as they did not assess any entering students in their studies.) However, when looking more closely at the results based upon students' levels of mastery of these generic skills, a different story emerges.

**Figure 3**

*Average CLA+ International Scores of Entering and Exiting Higher Education Students*
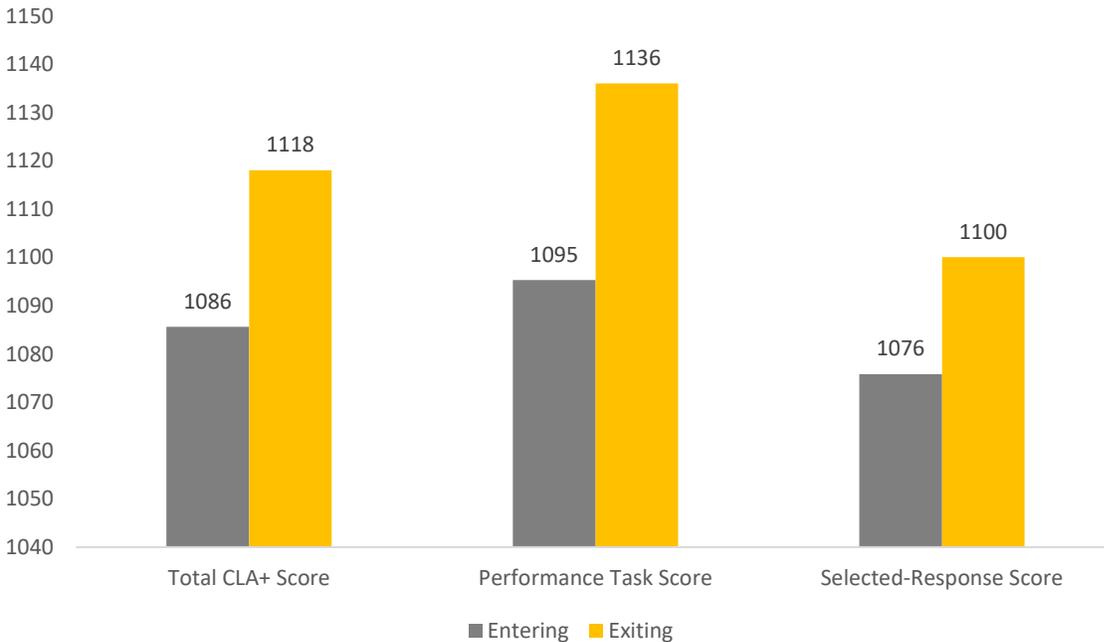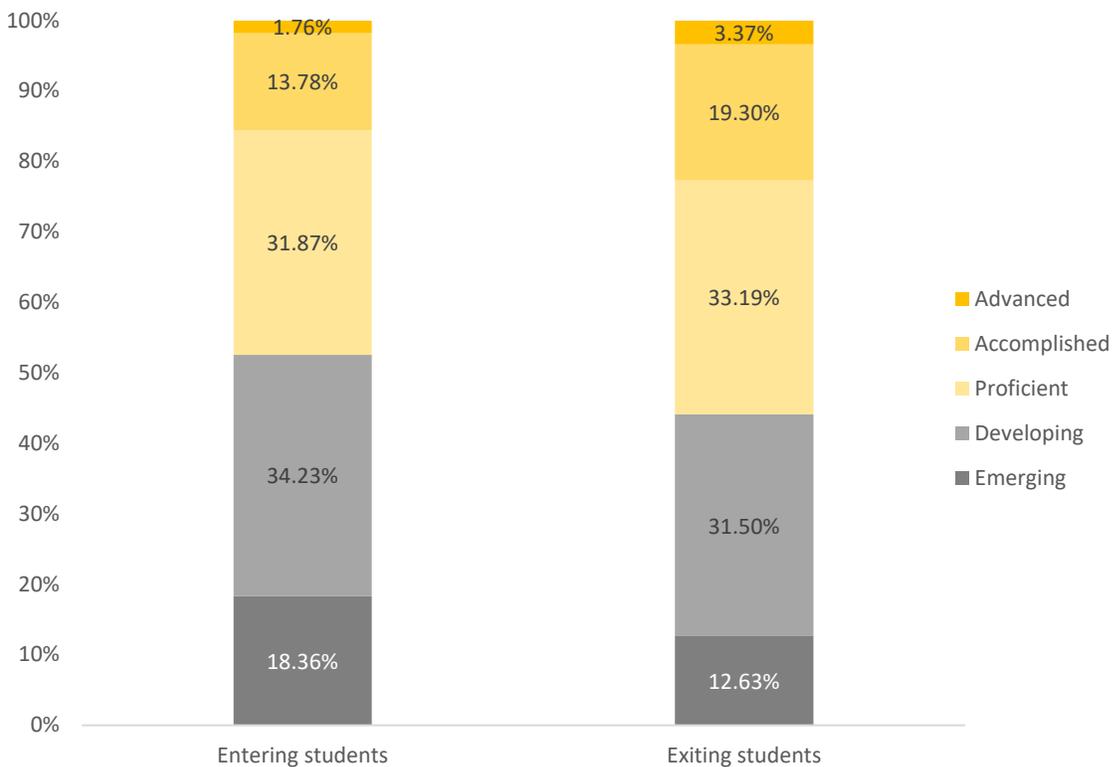


*Note.* N(entering) = 63,302; N(exiting) = 51,024.

**CLA+ Mastery Levels**
Mastery or competency levels for CLA+ were established in a series of standard setting studies (Zahner, 2014) by a panel of experts familiar with the performance levels of higher education students. The purpose of the study was to develop consensus among the panellists regarding a narrative profile of the knowledge, skills, and abilities required to perform at each mastery level. Then, during the rating activities, panellists relied on these descriptions to make their judgments based on the items and student performance. Five mastery levels were established in the study: Emerging, Developing, Proficient, Accomplished, and Advanced.

When investigating levels of mastery of generic skills (Zahner, 2014), CLA+ International results show that generally, there are gains in the level of mastery between entering and exiting students (Figure 4), just as there are gains in average scores. Whereas only approximately 47% of entering students have proficient, accomplished, or advanced mastery levels, that number increases to 56% for exiting students. Although there is an increase in mastery between entering and exiting students, a large percentage (44%) of exiting students are *still* not proficient in critical thinking, problem solving, and written communication upon graduation. And even within the top three mastery levels, at the very top, less than 4% of exiting higher education students attain advanced mastery. This can be partially attributed to the lack of coursework and focus on generic skills by higher education institutions. And even those institutions with generic skills as a learning outcome, measuring students upon entry to establish a baseline, implementing curriculum for improving these skills, and then measuring again prior to graduation are not practices that are commonly observed.

**Figure 4**
*CLA+ International Mastery Levels of Entering and Exiting Higher Education Students*



*Note. N*(entering) = 63,302; *N*(exiting) = 51,024.

**Model for Measuring, Teaching, and Improving Generic Skills**
To illustrate a proposed model for improving students' generic skills, the following is a case study of a program implemented by an undergraduate business school at a large public university within the United States.
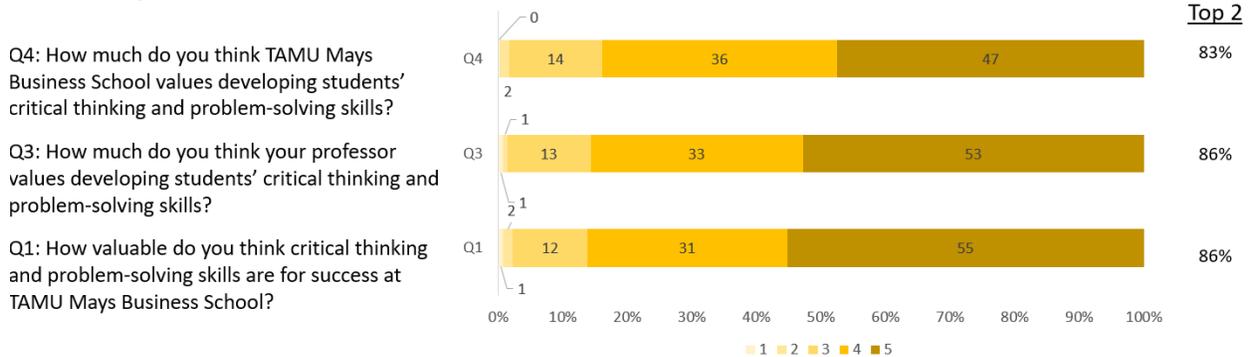
*Entering Students*
Entering students were assessed on their generic skills to identify strengths and areas for growth and to establish a baseline of their skills during their first week of classes, prior to any instruction provided by the university. These students were then given instruction on generic skills using a case-study approach as part of a week-long module. The curriculum was developed to focus students on their generic skills, using a case that required students to make a business decision. Multiple modules in varying classes focusing on students' generic skills will be delivered to these students throughout their higher education tenure.

By the institution implementing this program, the majority of the students themselves felt that the institution and their instructors greatly or extremely valued developing their generic skills (Figure 5).

**Figure 5**
*Institution Feedback Survey Results*
On a scale of 1 – 5 where 1 = not at all and 5 = extremely

Q4: How much do you think TAMU Mays Business School values developing students' critical thinking and problem-solving skills?

Q3: How much do you think your professor values developing students' critical thinking and problem-solving skills?

Q1: How valuable do you think critical thinking and problem-solving skills are for success at TAMU Mays Business School?
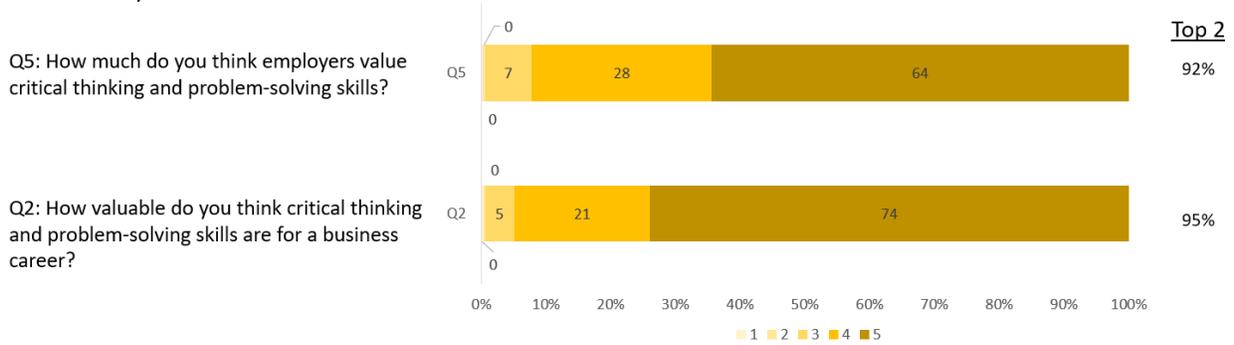


*Note. n* = 552 students.

The vast majority of students felt that generic skills are greatly or extremely valued by employers and greatly or extremely valuable for success in a career in business (Figure 6).

**Figure 6**
*Career Feedback Survey Results*

On a scale of 1 – 5 where 1 = not at all and
5 = extremely



Q5: How much do you think employers value
critical thinking and problem-solving skills?

Q2: How valuable do you think critical thinking
and problem-solving skills are for a business
career?

*Note. n* = 552.

*Exiting Students*
As this was a pilot and the first semester implementing the study, there was only a small cohort of
exiting students who were provided with advanced critical-thinking skills instruction. These students
were assessed using CLA+ during their final semester at the university, just prior to graduation. Half of
the students were given a specific module on critical thinking. The other half received the standard
curriculum with no targeted generic skills instruction.

Results from this small study showed that average CLA+ Total Scores for students who had classroom
instruction (*n* = 43) on critical thinking were statistically significantly higher than those who did not have
classroom instruction (*n* = 46; *t*(*df* = 87) = 1.74; *p* = .042) (Figure 7).

**Figure 7**
*Average CLA+ Total Scores for Students Who Did Not Receive Critical-Thinking Instruction versus Students
Who Did*
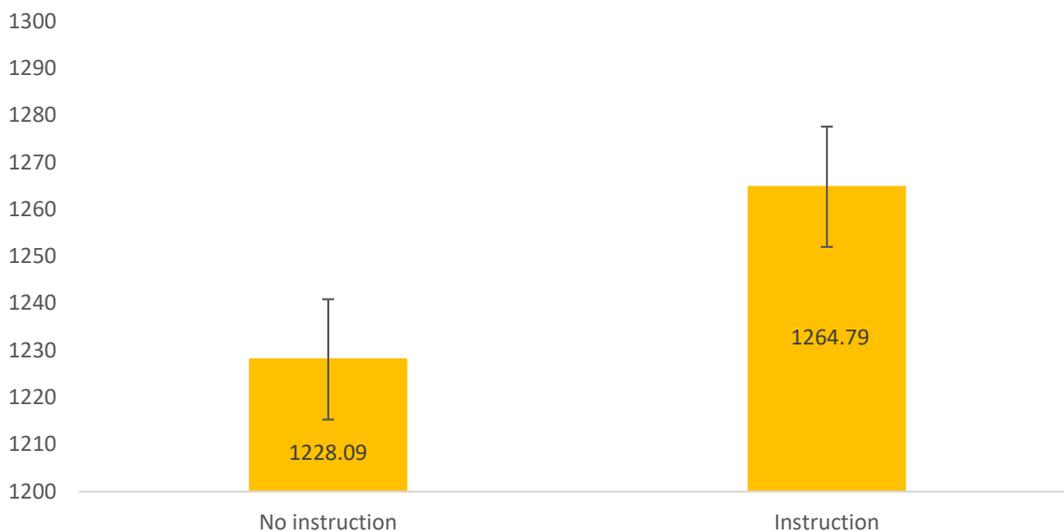


*Note. n*(no instruction) = 46; *n*(instruction) = 43; *t*(*df* = 87) = 1.74; *p* = .042.

To control for student motivation, which has been shown to affect assessment outcomes (Liu et al., 2012; Napoli & Raymond, 2004; Wise & DeMars, 2005; Wolf & Smith, 1995), students' self-reported effort and engagement on CLA+ were compared by cohort. Results showed that students' self-reported effort and engagement did not differ significantly by group (Figure 8). Those who did not receive classroom instruction on critical-thinking skills, on average, reported similar amounts of effort and engagement as those who received classroom instruction. Thus, motivation can potentially be removed as a factor in the observed average differences between the two groups (Figure 7).

**Figure 8**

*Average Self-Reported Effort and Engagement Scores for the Performance Task and Selected-Response Questions*
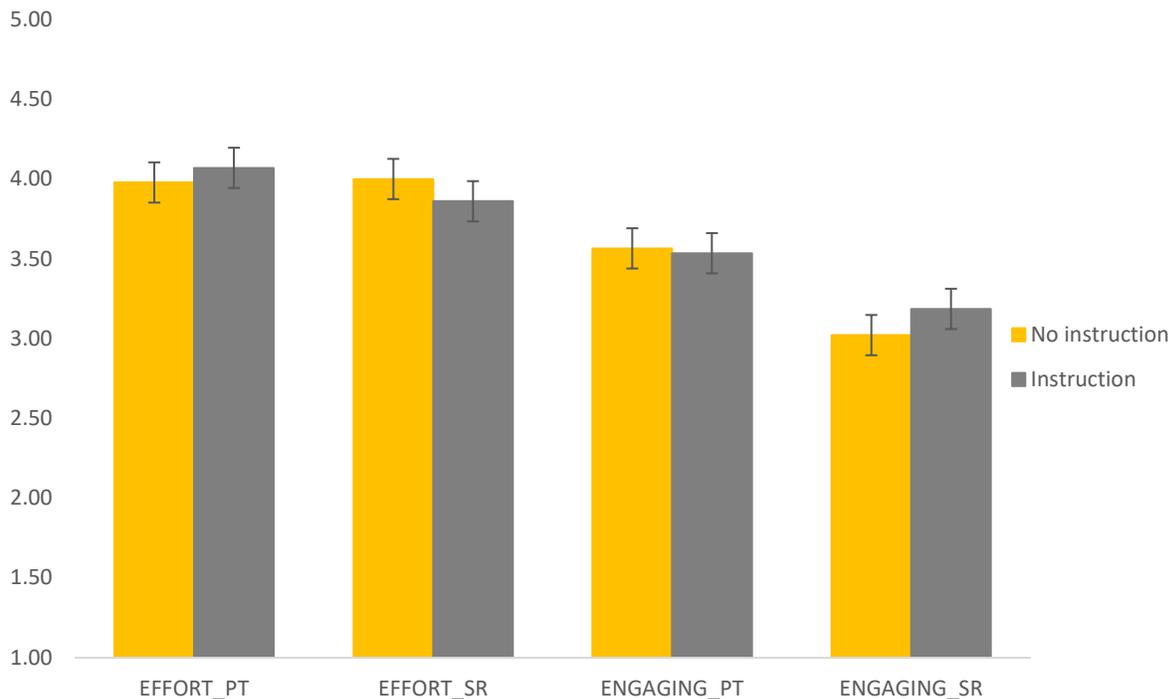


*Note.* $n$(no instruction) = 46; $n$(instruction) = 43.

**Conclusion**

The demand is high for valid and reliable assessments of higher education students' generic skills, which are essential for the 21st century workplace. The global marketplace clearly values generic skills such as critical thinking. However, institutions themselves may struggle to demonstrate that they are improving their students' generic skills, which calls into question the value and relevance of their programs. As the CLA+ demonstrate, performance-based assessments of generic skills could be used to measure students' skills and, if followed longitudinally, linked to success in the labor market.

The results of the implementation of the CLA+ assessment in six countries, presented in this paper are not particularly reassuring: 44% of the exiting students do not demonstrate sufficient proficiency in critical thinking skills. And only 23% achieve at the two highest levels of proficiency. Comparing entering and exiting students, there certainly is some learning gain in critical thinking, but far less than one would expect from a university education.

Universities are invited to focus more explicitly on the development of generic skills such as critical thinking. The small study reported in the second half of this paper illustrates that deliberate and systematic effort to develop critical thinking skills through appropriate instruction, do seem to work. More effort is needed, both for the assessment of learning outcomes such as critical thinking as for the design of effective instructional approaches to foster such skills.

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