Spring 2022 CLA+ Results

Institutional Report

University of Guam

cla+

EXECUTIVE SUMMARY

CLA+ is a valuable tool that measures critical thinking and written-communication skills of students in higher education. Institutions use CLA+ to estimate institutional and individual student growth of these essential skills, measure the efficacy of curricular and other programs, and demonstrate individual, class, and institutional proficiency. CLA+ results give individual students an opportunity to better understand their strengths and areas for improvements in order to master the skills necessary for post-collegiate success. CLA+ Digital Badging gives students who are proficient and beyond an opportunity to communicate these skills directly to employers. CLA+ results are a tool to measure growth on these skills and determine how your institution compares to other colleges and universities using CLA+.

University of Guam has a freshman mean CLA+ Total Score of 1021; this score is greater than or equal to the average freshman score at 37% of CLA+ schools. A score of 1021 demonstrates Developing mastery of the critical-thinking and written-communication skills measured by CLA+.

University of Guam's senior mean CLA+ Total Score is 1030, which is greater than or equal to the average senior score at 9% of CLA+ schools. A score of 1030 signifies Developing mastery of the skills measured by CLA+.

Given the mean CLA+ performance of University of Guam's freshmen and the mean parental education level of its seniors, University of Guam's value-added score is Below what would be expected relative to schools testing similar populations of students.

Mastery Levels

CLA+ Mastery Levels allow distinctions in student performance relative to students' proficiency in critical thinking and written communication. These levels contextualize CLA+ scores by interpreting test results in relation to the qualities exhibited by examinees. Each Mastery Level—Emerging, Developing, Proficient, Accomplished, and Advanced—corresponds to specific evidence of critical-thinking and written-communication skills.

CLA+ Subscores

In addition to total scores, there are six subscores reported across CLA+. The Performance Task—an essay-based section of the exam—is scored in three skill areas: Analysis and Problem Solving, Writing Effectiveness, and Writing Mechanics. Students receive criterion-referenced subscores for each skill category based on key characteristics of their written responses. Selected-Response Questions are also scored in three areas: Data Literacy, Critical Reading and Evaluation, and Critique an Argument. These subscores are scored based on the number of correct responses that students provide.

Growth Estimates

The institutional report contains two types of growth estimates: effect sizes and value-added scores.

Effect sizes characterize the amount of growth shown across classes, and are reported in standard deviation units. (Standard deviation is a measure of the distance between the mean, or average, and all other values in a score set.) Effect sizes are calculated by subtracting the mean scores of the freshmen from the mean scores of each subsequent class and dividing these amounts by the standard deviation of the freshman scores.

Value-added scores provide estimates of growth relative to other CLA+ schools. Specifically, value-added scores—also reported in standard deviation units—indicate the degree to which observed senior mean CLA+ scores meet, exceed, or fall below expectations as established by two factors: the level of education attained by the parents of the seniors and the mean CLA+ performance of freshmen at the school. The first variable serves as a proxy for all demographic variables and has been shown to be strongly related to academic outcomes in previous research, while the second variable serves as a baseline measure for the academic ability of the students at that school. Value-added scores are calculated for institutions that test entering students in the fall and exiting students in the spring.

Percentile Rankings

Percentile rankings allow for normative interpretations of your students' performance. These rankings are provided for your students' CLA+ scores, as well as for your institutional value-added scores, and indicate how well your institution performed relative to other CLA+ colleges and universities. Percentile rankings indicate the percentage of CLA+ institutions whose scores are equal to or less than your own.

In addition to your institutional results, your CLA+ institutional report includes a wide variety of information related to the measurement of higher-order thinking skills. Each section and appendix builds on the next to provide you with a full appreciation of how the CLA+ can support the educational mission at your school. The CLA+ institutional report's appendices include information to help you learn about CLA+ measurement, understand relevant statistical concepts, interpret your school's data, examine your performance in relation to performance at other CLA+ schools, and use CLA+ data to enhance student learning at your school.

SECTION 1: SUMMARY RESULTS, BY CLASS

Number of Students Tested, by Class

Note: University of Guam tested less than the minimum number of students deemed necessary for accurate reporting for the following class level(s): Juniors. CAE has determined that any fewer than 5 students per class tested would result in inaccurate summaries of that class. You can still find all the information about these students in the student data file provided with your reports, but Juniors have been removed from this report.

Freshmen	Sophomores	Juniors	Seniors
99	0	0	76

Summary of CLA+ Results, by Class

University of Guam has a senior mean CLA+ Total Score of 1030 and a percentile rank of 9. The corresponding Mastery Level for this score is Developing.

TOTAL SCORES

Class	Mean Score	Standard Deviation	25th Percentile Score	75th Percentile Score	Mean Score Percentile Rank	Effect Size vs. Freshmen
Freshmen	1021	120	937	1104	37	--
Seniors	1030	141	923	1137	9	0.07

PT SCORES

| Class	Mean Score	Standard Deviation	25th Percentile Score	75th Percentile Score	Mean Score Percentile Rank	Effect Size vs. Freshmen
Freshmen	1006	167	929	1118	28	--
Seniors	1022	177	898	1131	9	0.1

SRQ SCORES

Class	Mean Score	Standard Deviation	25th Percentile Score	75th Percentile Score	Mean Score Percentile Rank	Effect Size vs. Freshmen
Freshmen	1037	133	937	1141	47	--
Seniors	1036	172	886	1183	11	0

SECTION 2: DISTRIBUTION OF CLA+ SCORES, BY CLASS

Distribution of CLA+ Scores, by Class

Dashed lines show approximate Mastery Level cut scores.
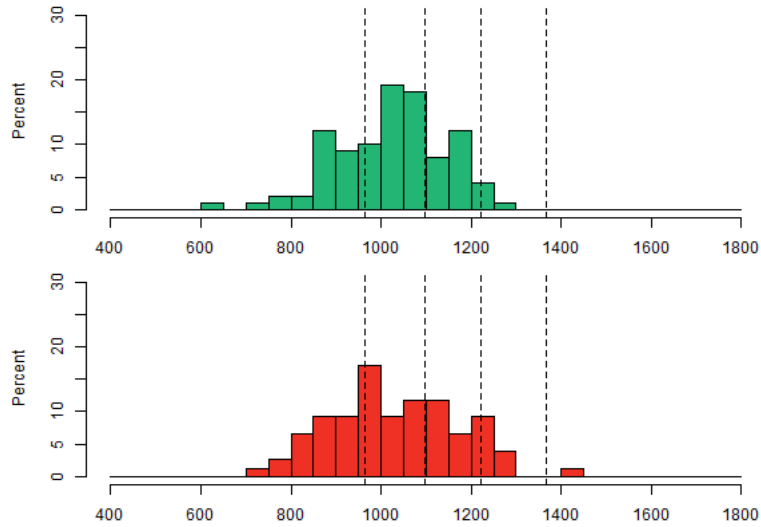
Mastery Levels, by Class

Class	Mean CLA+ Total Score	Mean Mastery Level	Percent Emerging	Percent Developing	Percent Proficient	Percent Accomplished	Percent Advanced
Freshmen	1021	Developing	29	43	24	3	0
Seniors	1030	Developing	36	32	24	8	1

SECTION 3: VALUE-ADDED SCORES

Value-Added Scores

	Expected Senior Mean Score	Actual Senior Mean Score
CLA+ Total Score	1095	1030
Performance Task	1079	1022
Selected Response Questions	1112	1036

	Value-Added Score	Performance Level	Percentile Rank	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
CLA+ Total Score	-1.49	Below	5	-2.76	-0.22
Performance Task	-1.09	Below	8	-2.42	0.24
Selected Response Questions	-1.74	Below	4	-3.17	-0.31

Expected vs. Observed CLA+ Total Scores

Legend:
- All schools in CLA+ norm sample
- Your school
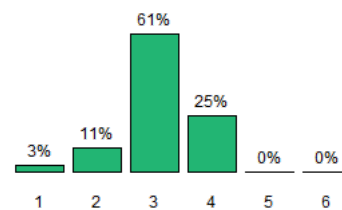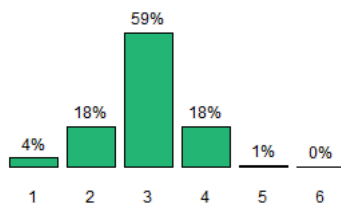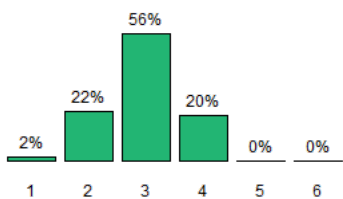- Observed performance equal to expected performance
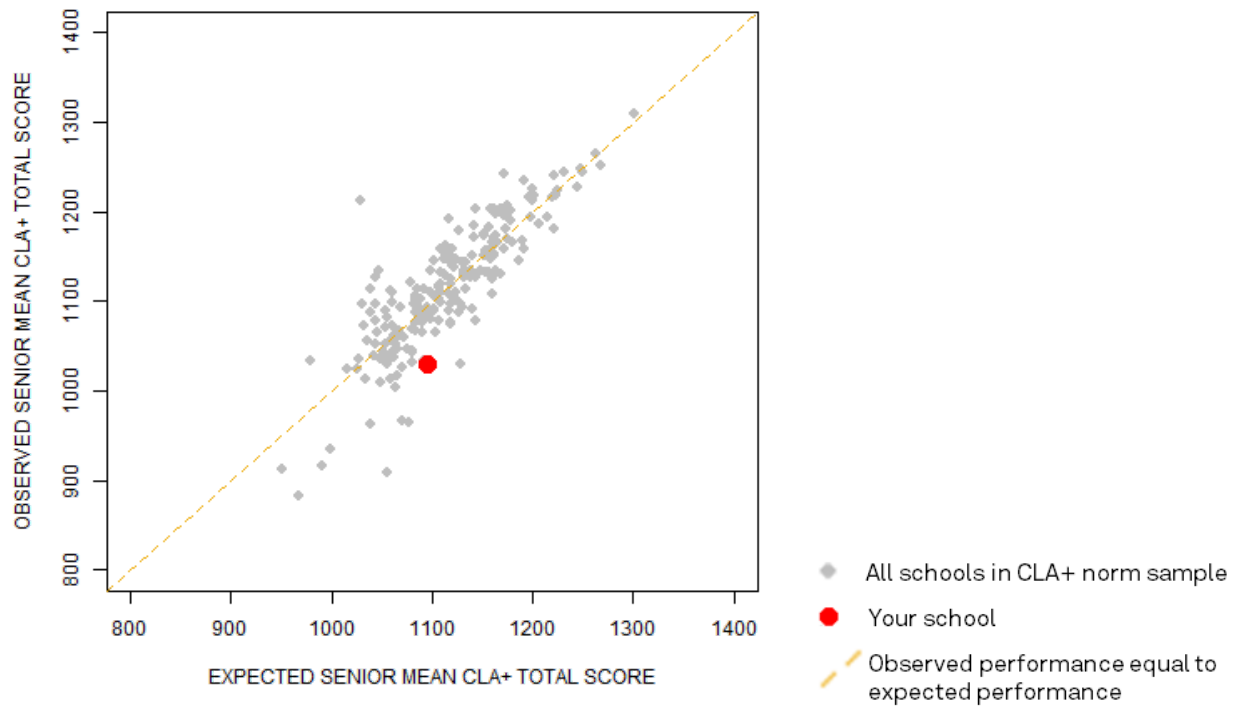
SECTION 4: CLA+ SUBSCORES

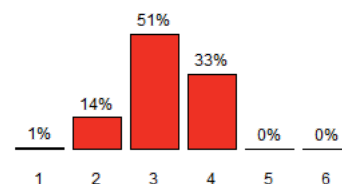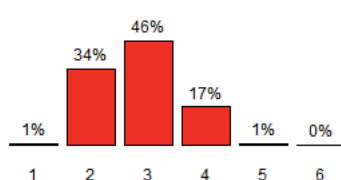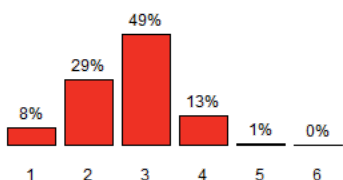## Performance Task Subscores (in percentages)

| Analysis & Problem-Solving | Writing Effectiveness | Writing Mechanics |

Freshmen

Analysis & Problem-Solving: 1: 2%, 2: 22%, 3: 56%, 4: 20%, 5: 0%, 6: 0%

Writing Effectiveness: 1: 4%, 2: 18%, 3: 59%, 4: 18%, 5: 1%, 6: 0%

Writing Mechanics: 1: 3%, 2: 11%, 3: 61%, 4: 25%, 5: 0%, 6: 0%

Seniors

Analysis & Problem-Solving: 1: 8%, 2: 29%, 3: 49%, 4: 13%, 5: 1%, 6: 0%

Writing Effectiveness: 1: 1%, 2: 34%, 3: 46%, 4: 17%, 5: 1%, 6: 0%

Writing Mechanics: 1: 1%, 2: 14%, 3: 51%, 4: 33%, 5: 0%, 6: 0%

Selected-Response Question Subscores

	Data Literacy			Critical Reading and Evaluation			Critique an Argument		
	Mean Score	25th Percentile	75th Percentile	Mean Score	25th Percentile	75th Percentile	Mean Score	25th Percentile	75th Percentile
Freshmen	505	464	542	488	447	548	508	452	584
Seniors	490	434	576	501	427	566	510	415	557

SECTION 5: STUDENT EFFORT AND ENGAGEMENT

Student Effort Survey Responses (in percentages)

PERFORMANCE TASK

	No Effort At All	A Little Effort	A Moderate Amount of Effort	A Lot of Effort	My Best Effort
Freshmen	0	5	48	30	16
Seniors	0	11	45	21	23

SELECTED-RESPONSE QUESTIONS

	No Effort At All	A Little Effort	A Moderate Amount of Effort	A Lot of Effort	My Best Effort
Freshmen	0	9	44	31	15
Seniors	1	5	57	24	12

Student Engagement Survey Responses (in percentages)

PERFORMANCE TASK

	Not At All Engaging	Slightly Engaging	Moderately Engaging	Very Engaging	Extremely Engaging
Freshmen	6	15	34	33	11
Seniors	7	17	35	37	4

SELECTED-RESPONSE QUESTIONS

	Not At All Engaging	Slightly Engaging	Moderately Engaging	Very Engaging	Extremely Engaging
Freshmen	5	29	28	27	10
Seniors	7	25	39	28	1

SECTION 6: PT SCORES BY TIME, EFFORT, AND ENGAGEMENT

PT Section Scores
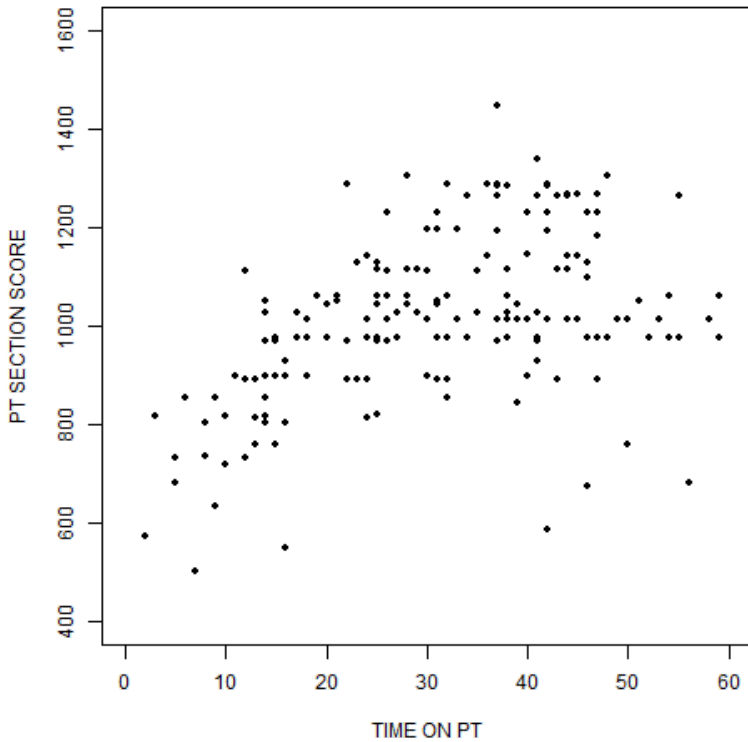
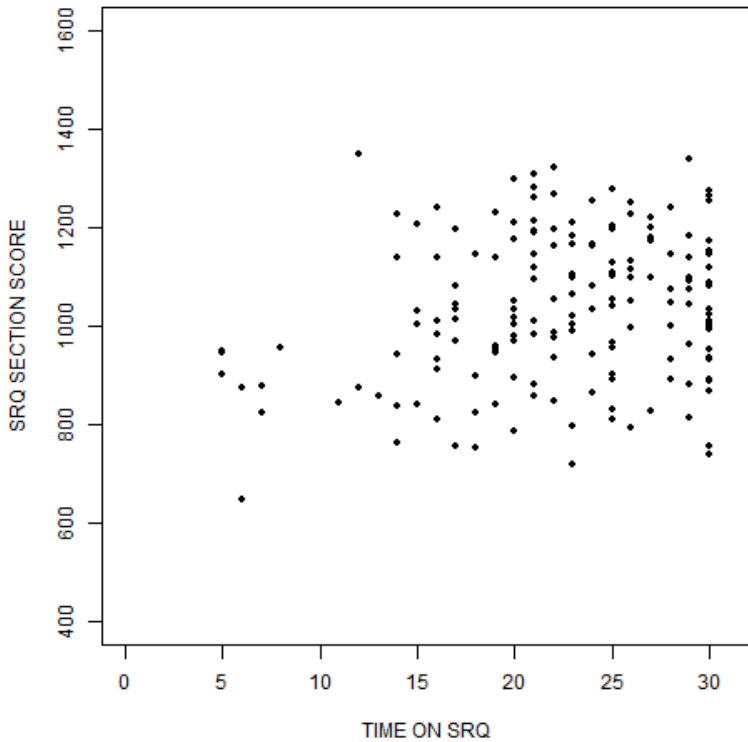## PT SECTIONS SCORES BY EFFORT ON PT

	No Effort At All	A Little Effort	A Moderate Amount of Effort	A Lot of Effort	My Best Effort
Freshmen	NaN	1007	968	1017	1097
Seniors	NaN	913	978	1139	1052

PT SECTIONS SCORES BY ENGAGEMENT ON PT

	Not At All Engaging	Slightly Engaging	Moderately Engaging	Very Engaging	Extremely Engaging
Freshmen	834	985	995	1028	1090
Seniors	888	943	1005	1087	1136

SECTION 7: SRQ SCORES BY TIME, EFFORT, AND ENGAGEMENT

SRQ Section Scores

SR SECTIONS SCORES BY EFFORT ON SR

	No Effort At All	A Little Effort	A Moderate Amount of Effort	A Lot of Effort	My Best Effort
Freshmen	NaN	969	1034	1054	1049
Seniors	1034	914	1014	1102	1088

SR SECTIONS SCORES BY ENGAGEMENT ON SR

	Not At All Engaging	Slightly Engaging	Moderately Engaging	Very Engaging	Extremely Engaging
Freshmen	986	1009	1034	1061	1084
Seniors	986	963	1027	1141	950

SECTION 8: STUDENT SAMPLE SUMMARY

Student Sample Summary

Demographic Characteristic		Freshmen N	Freshmen %	Seniors N	Seniors %
Gender	Male	27	27	27	36
	Female	72	73	44	59
	Decline to State	0	0	3	4
Primary Language	English	77	78	52	69
	Other	22	22	23	31
Field of Study	Sciences, Mathematics, & Engineering	22	22	0	0
	Social Sciences	7	7	2	3
	Humanities & Languages	3	3	12	16
	Business	24	24	38	51
	Helping/Services	34	34	22	29
	Undecided or Other	9	9	1	1
Race/Ethnicity	American Indian/Alaska Native/Indigenous	0	0	0	0
	Asian (including Indian subcontinent and Philippines)	61	62	37	49
	Native Hawaiian or other Pacific Islander	32	32	31	41
	African-American/Black (including African and Caribbean), non-Hispanic	1	1	0	0
	Hispanic or Latino	1	1	0	0
	White (including Middle Eastern), non-Hispanic	0	0	0	0
	Other	3	3	2	3
	Decline to State	1	1	5	7
Parental Education	Less than High School	6	6	2	3
	High School	20	20	15	20
	Some College	16	16	16	21
	Bachelor's Degree	39	39	26	35
	Graduate or Post-Graduate Degree	13	13	13	17
	Don't Know	5	5	3	4

APPENDIX A: INTRODUCTION TO CLA+

In 2002, the Collegiate Learning Assessment (CLA) was introduced as a major initiative of the Council for Aid to Education (CAE). Since its launch, the CLA has offered institutions a value-added approach to the measurement of higher-order thinking skills. The carefully designed questions in this examination require students to analyze, evaluate, and synthesize information as they demonstrate their ability to think critically and solve problems. Hundreds of institutions and hundreds of thousands of students have participated in the CLA testing program to date.

Initially, the CLA focused on helping institutions estimate their contributions to the development of students' higher-order thinking skills. As such, the institution rather than the student was the primary unit of analysis. In 2013, CAE expanded this scope with the introduction of CLA+. This enhanced version of the examination provides useful and reliable information about educational growth at the student level as well as the institutional level. Other features new to CLA+ include subscores for Data Literacy, critical reading and evaluation, and critiquing an argument. The addition of mastery levels also supports the reporting of criterion-referenced results in relation to skill proficiency.

CLA+ includes two major components: a Performance Task (PT) and a series of Selected-Response Questions (SRQs).

The Performance Task presents students with a real-world situation that requires a purposeful written response. Students are asked to address an issue, propose the solution to a problem, or recommend a course of action to resolve a conflict. They are instructed to support their responses by utilizing information provided in a Document Library. This repository contains a variety of reference materials, such as technical reports, data tables, newspaper articles, office memoranda, and emails. A full PT includes four to nine documents in the library. Students have 60 minutes to complete this constructed-response task.

In the second part of the examination, students are asked to answer 25 Selected-Response Questions. Ten questions measure Data Literacy and ten measure critical reading and evaluation. Another five questions call for students to critique arguments by identifying logical flaws and questionable assumptions. Like the PT, the 25 SRQs are document-based and require students to draw information from provided materials. Students have 30 minutes to complete this section of the assessment.

CLA+ is a powerful assessment tool created to help teachers and students meet their educational objectives. The examination supports programmatic change, particularly in regard to higher-order thinking skills. It shows faculty members, school administrators, and other interested individuals the skill areas requiring attention on an institutional level to strengthen instruction and maximize learning. CLA+ also provides students with direct, formative feedback they can use to evaluate and reflect on their development on a personal level.

Educators may decide to consult their students' CLA+ results when making individualized decisions related to admission, placement, scholarships, or grading. Institutions may also wish to use CLA+ results to provide independent corroboration of competency-based learning, or to recognize students who have exhibited the higher-order thinking skills required for success in twenty-first century careers. Students may choose to share their results with potential employers or graduate schools as well to provide evidence of the skills they have acquired at their college or university. A single test cannot serve as the benchmark for all student learning within higher education, but there are certain skill areas deemed important by most educators across virtually all institutions. The higher-order thinking skills that CLA+ measures fall into this crucial category.

CLA+ allows institutions to benefit from a model of continuous improvement that positions educators as central actors in the relationship between assessment, instruction, and the learning process. Significantly, it provides educators with a frame of reference for determining the status of skill achievement within their institutions as well as the progress their students have made relative to the development of students at other colleges and universities. That said, CLA+ does not rank institutions; rather, it highlights differences between them that can identify opportunities for educational improvements. Similarly, CLA+ does not rank students but instead highlights areas where individuals excel or may need to focus more effort. CLA+ is an instrument designed to make a meaningful contribution to the improvement of teaching and learning. In this respect, it is in a league of its own.

APPENDIX B: METHODS

Introduction

CLA+ uses innovative questions and tasks to evaluate students' higher-order thinking skills. Each test form includes one Performance Task (PT) and 25 Selected-Response Questions (SRQs). The PT section measures three domains: analysis and problem solving, writing effectiveness, and writing mechanics. The SRQ section measures three domains as well: Data Literacy, critical reading and evaluation, and critiquing an argument, which involves the identification of logical flaws and questionable assumptions. Students have 90 minutes to complete the two sections of the assessment—60 minutes for the PT and 30 minutes for the SRQs.

Test results for CLA+ are delivered to institutions after administration windows have closed. Your institutional report presents scoring information for each section of the examination as well as total CLA+ performance for freshmen testing in the fall window and sophomores, juniors, and seniors testing in the spring window. The report includes analyses of the PT score, the SRQ score, and the Total CLA+ score.

Section Scores

PT and SRQ scores indicate the mean, or average, performance of all students who completed each section. PT mean scores are calculated by adding three raw subscores—for analysis and problem solving, writing effectiveness, and writing mechanics—and converting the sum using a common scale. SRQ mean scores are also calculated by adding three raw subscores—for Data Literacy, critical reading and evaluation, and critique an argument—and converting this sum using a common scale. Total CLA+ scores are then calculated by averaging the PT and SRQ mean scores. For more information about the scaling process, please see the appendix on Scaling Procedures.

In addition to mean scores, your report includes 25th and 75th percentile scores, which characterize the score values earned by 25% and 75% of your students, respectively. For example, a 25th percentile score of 974 for the total CLA+ would inform you that 25% of your students earned 974 or

less. Similarly, a 75th percentile score of 1096 would let you know that 75% of your students earned 1096 or less. The values that fall between the 25th and 75th percentile scores thus tell you the score values earned by 50% of your students. To extend the previous example, the 25th and 75th percentile scores reported would let you know that 50% of your students earned CLA+ Total Scores between 974 and 1096.

Your report may also include percentile rankings of your mean scores. These values let you know the percentage of institutions whose mean scores were lower than yours. Comparative in nature, these statistics are calculated based on the institutions testing within your administration window. Percentile rankings may thus not always be available, as they depend on the characteristics of the institutional sample.

Growth Scores

Finally, your institutional report contains two types of growth estimates for the students in your school who took CLA+: effect sizes and value-added scores.

Effect sizes characterize the amount of growth evident across classes. They do so by relating the performance of the freshman class to that of the sophomore, junior, and senior classes. Please note that these statistics are available based on your students' participation in CLA+ testing by class. They do not take into account the performance of students at other institutions.

Effect sizes are calculated by subtracting the mean scores of the freshmen from the mean scores of each subsequent class and dividing these amounts by the standard deviation of the freshmen scores. (Standard deviation is a measure of the distance between the mean, or average, and all other values in a score set.) Effect sizes are reported in standard deviation units. By comparing effect sizes, you can gauge student growth over time and begin to analyze patterns of teaching and learning at your institution.

While effect sizes characterize growth from freshman to senior year within an institution, value-added scores relate that growth meaningfully to the growth of students across other colleges and universities. A simple comparison of the average achievement at all schools tends to present selective institutions in a favorable light and overlook the educational efficacy of schools admitting students with weaker academic backgrounds. Value-added modeling addresses this situation by providing us with scores comparable to those of institutions with similar students. It is thus frequently viewed as an equitable way of estimating an institution's contribution to learning and thus of demonstrating its relative educational efficacy.

To calculate value-added estimations, we employ a statistical technique known as hierarchical linear modeling (HLM). This method yields value-added scores that indicate the degree to which observed senior CLA+ mean scores at an institution meet, exceed, or fall below expectations as established by two factors: the seniors' parental education scores and the mean CLA+ performance of freshmen at the

school. See the appendix on Modeling Details for more information.

Value-added scores are placed on a standardized scale and assigned performance levels. These scores are also known as "z-scores" and they relate performance to the mean, or average, value-added score of the norm sample. The categories for value-added scores are as follows:

- above +2.00: "well above expected,"
- +2.00 to +1.00: "above expected,"
- +1.00 to -1.00: "near expected,"
- -1.00 to -2.00: "below expected," and
- below -2.00: "well below expected".

Value-added scores are also accompanied by confidence intervals, which provide information about the precision of the estimates. Narrow confidence intervals indicate more precision, while wider intervals indicate less precision. Please note that our analyses take the results from all CLA+ institutions into consideration, regardless of sample size or sampling strategy. Therefore, we also encourage you to apply due caution when interpreting your results if you tested a very small sample of students or believe that the students in your institution's sample are not representative of the larger student body.

APPENDIX C: EXPLANATION OF YOUR RESULTS

This appendix provides guidance on interpreting the institutional results presented in your report. To ensure that the results in your report are based on a consistent sample, your students must complete all sections of the assessment, including the Performance Task, Selected-Response Questions, and the accompanying survey.

Please note that students designated for exclusion from analyses by your institution during registrar data submission will not be included in the sample. Please also note that CAE may set a minimum value on the number of students testing per class level that provide complete information in order to populate that class level in your school's reports.

The results discussed in this appendix include percentile rankings and value-added scores, which relate performance in your school to performance at other CLA+ colleges and universities. To see cross-institutional summary data, please refer to the appendix on Results Across CLA+ Institutions. For a complete list of all CLA+ institutions, see the appendix on the Institutional Sample.

Summary of Results, by Class

The first table in this section of the report is titled Number of Students Tested, by Class. This table specifies the number of students summarized in this report by class level. If any class level does not meet the minimum number of required students testing with complete data, this class level will be reported as 0. All of the subsequent data in this report are based on the number of students reported in this table.

The next table, Summary of CLA+ Results, by Class, presents a statistical overview of the students in your sample. It provides mean scores, standard deviations, and 25th and 75th percentiles for each class level tested. If you tested freshmen and/or seniors, you will get percentile ranks for the mean scores in each of those classes. If you tested freshmen and at least one other class, you will get effect sizes for the non-freshmen class(es) tested.

The Mean Score column lists the average scores for students in your sample. These scores are also considered your institutional CLA+ scores. The Standard Deviation column gives an estimate of the amount of scatter, or dispersion, in the scores at that class level, around the mean score. Higher standard deviations indicate that scores were further from the mean score at that class level and lower standard deviations indicate that scores were closer to the mean score at that class level.

The 25th Percentile Score column indicates which score separates the bottom 25% of students in that class from the top 75% of students in that class. Similarly, the 75th Percentile Score column indicates which score separates the bottom 75% of students in that class from the top 25% of students in that class. Additionally, 50% of students in the given class score between the 25th and 75th Percentile Scores.

The Mean Score Percentile Rank indicates how well your institution performed relative to other CLA+ colleges and universities for the specified class. The values in this column represent the percentage of institutions whose mean scores, in the respective class(es), were lower than or equal to yours. Mean score percentile ranks are only available at the freshman and senior class levels. For a summary of institutional performance at CLA+ colleges and universities, please refer to the appendix on Results Across CLA+ Institutions.

The Effect Size vs. Freshmen column presents growth estimates across class levels at your school. Effect sizes relate the performance of upperclass students (sophomores, juniors, and/or seniors) to that of freshmen, allowing you to evaluate student learning outcomes over time relative to your own entering students. Effect sizes are reported in units of standard deviation established by the performance of freshmen within your school. An effect size of 0 indicates no difference in the performance of entering and exiting students, positive effect sizes indicate improved performance, and negative effect sizes indicate worse performance. Larger magnitudes of effect sizes (i.e., effect sizes further away from 0) indicate a greater effect and smaller magnitudes (i.e., effect sizes closer to 0) indicate more negligible changes in performance.

Distributions of Scores and Mastery Levels, by Class

This section of your institutional report focuses on Mastery Levels, which are criterion-referenced indicators of performance. On individual reports, Mastery Levels are determined by students' CLA+ Total Scores. On institutional reports, they are determined by each class level's mean CLA+ Total Score.

There are five Mastery Levels: Emerging, Developing, Proficient, Accomplished, and Advanced. Please see the appendix on Mastery Levels for a detailed description of these categories and the process through which they were derived.

The first part of this section gives the distribution of CLA+ Total Scores for each class level, and includes vertical reference lines showing the approximate location of the cut scores for each Mastery Level. Note that although CAE never reveals the exact values of the Mastery Level cut scores, one can see approximate locations from these graphs.

The second part of this section provides a summary of Mastery Levels by class level. For each class level tested, the first column provides the mean CLA+ Total Score, the second column provides the Mastery Level corresponding to that mean score, and the third through seventh columns provide a frequency table for the Mastery Levels attained by the students in that class.

Value-Added Scores

The section of your institutional report uses value-added estimates to relate growth at your institution to growth at other schools.

The first table provides your students' expected senior mean CLA+ scores alongside the actual (observed) senior mean CLA+ scores. Three sets of value-added scores and related output are provided: one corresponding to the Total Scores, a second corresponding to the PT Scores, and a third corresponding to the SRQ Scores. Expected scores are determined by the typical performance of seniors at institutions testing similar samples of students. These samples are identified based on senior parental education scores and mean freshman performance on CLA+.

The second table presents the value-added results. Your value-added scores are calculated by obtaining the difference between your institution's observed and expected senior mean CLA+ scores. These amounts are then converted to standard deviation units.

Value-added scores are accompanied by Performance Levels, which are calculated as follows:

- above +2.00: "well above expected,"
- +2.00 to +1.00: "above expected,"
- +1.00 to -1.00: "near expected,"
- -1.00 to -2.00: "below expected," and
- below -2.00: "well below expected."

In addition to Performance Levels, each value-added score is assigned a Percentile Rank. This number tells you the percentage of colleges and universities whose value-added score is less than or equal to that of your institution.

Importantly, value-added scores are estimates of unknown quantities, expectations rather than observations. Their evaluation should thus be contextualized by information about the precision of the estimate. The Confidence Intervals which accompany value-added scores in your report provide this type of information. Narrow confidence intervals indicate more precision in the estimate, while wider intervals indicate less precision.

CAE uses hierarchical linear modeling (HLM) to calculate value-added scores, determine their standard errors, and compute 95% confidence intervals unique to each school. Institutions testing larger samples of seniors obtain smaller standard errors and more narrow confidence intervals, which indicate a more precise estimate of value-added scores. Strongly related to senior sample size, standard errors reflect variation in parental education and CLA+ scores within and between institutions. Corresponding confidence intervals represent the range of value-added scores we would anticipate if testing were repeated a number of times with different samples of students. To elaborate, if testing were conducted 100 times with different samples of students, about 95 out of the 100 confidence intervals reported would include your institution's "true" value-added scores. Here, it is critical to understand that confidence levels do not indicate uncertainty in your "true" value-added scores. They indicate uncertainty in the estimation of these scores as a result of sampling variation.

The final diagram in this section is a scatterplot of Expected vs. Observed CLA+ Scores. This graph illustrates the performance of all four-year colleges and universities relative to their expected performance as predicted by the value-added model. The gold diagonal line represents the points at which expected and observed senior scores are equivalent. The vertical distance from the diagonal line indicates the value added by an institution. Institutions above the diagonal line add more value than expected based on the model; institutions below the line add less value than expected. Your institution appears as a red data point in this chart.

For more information about CLA+ value-added methodology, please see the appendix on Modeling Details. Here, you will find information about model parameters as well as additional guidance on interpreting confidence intervals and instructions for using your data file to calculate value-added estimates for student subgroups.

CLA+ Subscores, by Class

Your report includes Total CLA+ scores as well as scores for the Performance Task (PT) and Selected-Response Questions (SRQs). These section scores based on item type are further divided into subscores based on skill categories. The three subscores for the PT indicate performance in Analysis and Problem Solving, Writing Effectiveness, and Writing Mechanics. The three subscores for the SRQs indicate performance in Data Literacy, Critical Reading and Evaluation, and Critique an Argument, which involves the identification of logical flaws and questionable assumptions.

The first table in this section is Performance Task: Distribution of Subscores (in percentages). The charts in this table indicate the distribution of subscores for each of the three skill categories by class level. The charts present the percentage of your students at each score value. Ranging from 1 to 6, each value is associated with a specific set of response characteristics. For more information about the scoring rubric, please see the appendix on Scoring CLA+.

The second table, Selected-Response Questions: Mean Subscores, provides summary statistics for the three skill categories measured in the SRQ section. The scores in this CLA+ section are determined by the number of correct responses and adjusted based on item difficulty. Each subscore is reported on a scale of approximately 200 to 800.

Mean Scores in this table reflect the average score received by each class for each of the three skill categories. The 25th Percentile Scores indicate the score values at or below which 25% of your students scored (again, by class level). The 75th Percentile Scores indicate the score values at or below which 75% of your students scored. By comparing results in the 25th and 75th columns, you can determine the range in which 50% of your students scored.

Student Effort and Engagement

CLA+ ends with a set of survey questions, two of which are related to the assessment. One question asks students how much effort they put into completing the Performance Task (PT) and 25 Selected-Response Questions (SRQs). The other question asks students how engaging they found each section of the assessment to be. Students indicate their answers on a likert scale, ranging from "No effort at all" to "My best effort" and "Not at all engaging" to "Extremely engaging." The table in this section, Student Effort and Engagement Survey Responses, provides the percentage of students who selected each answer option by class level.

The survey questions are designed to help institutions consider the role that effort and engagement may play in student performance on CLA+. Survey results may also be consulted when evaluating the impact that recruitment efforts have on student motivation.

For a distribution of survey responses across all colleges and universities, please see the appendix on Results Across CLA+ Institutions. By comparing your institution's survey results with those of all schools, you can examine the motivation and engagement of your students relative to that of students at other colleges and universities.

Student Sample Summary

The final section of your institutional report includes a Student Sample Summary, which provides the number and percentage of students within your sample who meet various characteristics. These characteristics include: transfer status, gender, primary language, field of study, race or ethnicity, and parental education level. Transfer

status is reported by participating institutions during the registrar data collection process. All other demographic characteristics are provided by students as part of the post-assessment survey.

APPENDIX D: INSTITUTIONAL SAMPLE

The institutional sample for CLA+ is comprised of schools that tested freshmen in fall 2013 and schools that tested sophomores, juniors, or seniors in spring 2014.

While the sample changed annually for the CLA, it will remain fixed for CLA+. The stable sample allows institutions to track their progress more easily. As institutions make national comparisons from year to year, they will no longer face the question of whether changes in

percentile rankings reflect changes in institutional performance or differences in the comparative sample.

To ensure national representativeness, CAE will continue to assess the institutional sample. If significant changes arise, CAE will take steps to update the sample as necessary.

Carnegie Classification

The following table shows groupings by Basic Carnegie Classification for colleges and universities across the nation and for CLA+ schools. The spread among CLA+ schools corresponds fairly well with that of the 1,683 four-year, not-for-profit institutions across the nation, though with a somewhat higher proportion of Master's colleges and universities.

Please note that counts in this table exclude colleges and universities that do not fall into these categories, such as Special Focus Institutions and schools based outside of the United States.

	Nation (N=1,683)		CLA+ (N=157)	
Carnegie Classification	N	%	N	%
Doctorate-Granting Universities	283	17	23	12
Master's Colleges and Universities	651	39	87	47
Baccalaureate Colleges	749	45	47	25
Source: Carnegie Foundation for the Advancement of Teaching, Carnegie Classifications Data File, January 16, 2014.				

School Characteristics

The following table provides statistics comparing important characteristics of colleges and universities across the nation with those of CLA+ schools. These statistics suggest that CLA+ schools are fairly

representative of four-year, not-for-profit institutions nationwide. Public school percentage and undergraduate student body size are notable exceptions.

School Characteristics	Nation	CLA+
Percentage Public	30	60
Percentage Historically Black College or University (HBCU)	4	3
Mean Percentage of Undergraduates Receiving Pell Grants	31	32
Mean Six-Year Graduation Rate	51	49
Mean Barron's Selectivity Rating	3.6	3.1
Mean Estimated Median SAT Score	1058	1030
Mean Number of FTE Undergraduate Students (Rounded)	3,869	7,130
Mean Student-Related Expenditures per FTE Student (Rounded)	$12,330	$10,469

Sources: College Results Online dataset, managed by and obtained with permission from the Education Trust, covers most four-year Title IV-eligible higher-education institutions in the United States. Data were constructed from IPEDS and other sources. Because all schools did not report on every measure in the table, the averages and percentages may be based on slightly different denominators. Data also come from the Carnegie Foundation for the Advancement of Teaching, Carnegie Classifications Data File, January 16, 2014.

CLA+ Institutions

The colleges and universities listed below in alphabetical order constitute the institutional sample for CLA+.

Alaska Pacific University
Antelope Valley College
Appalachian State University
Augsburg College
Augustana College (SD)
Aurora University
Barton College
Bellarmine University
Bob Jones University
Bowling Green State University
Bridgewater College
Brigham Young University-Idaho
California Maritime Academy
California Polytechnic State University, San Luis Obispo
California State Polytechnic University, Pomona
California State University, Bakersfield
California State University, Channel Islands
California State University, Chico
California State University, Dominguez Hills
California State University, East Bay
California State University, Fresno
California State University, Fullerton
California State University, Long Beach
California State University, Los Angeles
California State University, Monterey Bay
California State University, Monterey Bay, Computer Science and Information Technology
California State University, Northridge
California State University, Sacramento
California State University, San Bernardino
California State University, San Marcos
California State University, Stanislaus
Centenary College of Louisiana
Christopher Newport University
Clarke University
College of Saint Benedict/Saint John's University

Collin College
Colorado Christian University
Concord University
Concordia College
Culver-Stockton College
CUNY - Baruch College
CUNY - Borough of Manhattan Community College
CUNY - Bronx Community College
CUNY - Brooklyn College
CUNY - College of Staten Island
CUNY - Hostos Community College
CUNY - Hunter College
CUNY - John Jay College of Criminal Justice
CUNY - Kingsborough Community College
CUNY - LaGuardia Community College
CUNY - Lehman College
CUNY - Medgar Evers College
CUNY - New York City College of Technology
CUNY - Queens College
CUNY - Queensborough Community College
CUNY - The City College of New York
CUNY - York College
Dillard University
Drexel University, Department of Architecture and Interiors
Earlham College
East Carolina University
Eastern Connecticut State University
Emory & Henry College
Fayetteville State University
Flagler College
Florida International University Honors College
Frostburg State University
Georgia College & State University
Great Basin College
Hamline University
Hardin-Simmons University

Hastings College
Hesston College
Hong Kong Polytechnic University
Howard Community College
Humboldt State University
Illinois College
Indiana University of Pennsylvania
Jacksonville State University
Keene State College
Kent State University
Kepler Kigali
Keuka College
LaGrange College
Lake Forest College
Lee University
Lewis University
Lynchburg College
Marshall University
Miami University - Oxford
Miles College
Minneapolis College of Art and Design
Minnesota State Community & Technical College
Mississippi University for Women
Monmouth University
Montclair State University
Morgan State University
Morningside College
National Louis University
Nevada State College
New York University - Abu Dhabi
Newberry College
Nicholls State University
North Dakota State University
Nyack College
Ohio Wesleyan University
Our Lady of the Lake University
Pittsburg State University
Plymouth State University
Presbyterian College
Purchase College - SUNY
Quest University
Ramapo College of New Jersey
Robert Morris University
Roger Williams University
Saginaw Valley State University
San Diego State University
San Francisco State University
San Jose State University
Schreiner University
Shepherd University
Shippensburg University
Sonoma State University
Southern Connecticut State University
Southern New Hampshire University
Southern Virginia University
Southwestern University
St. Ambrose University

St. John Fisher College
Stetson University
Stonehill College
SUNY Cortland
Texas A&M International University
Texas A&M University-Texarkana
Texas State University-San Marcos
Texas Tech University
The Citadel
The College of Idaho
The Ohio State University
The Richard Stockton College of New Jersey
The Sage Colleges
Truckee Meadows Community College
Truman State University
University of Bridgeport
University of Colorado, Boulder
University of Evansville
University of Great Falls
University of Guam
University of Hawaii at Hilo, College of Business and Economics
University of Houston
University of Jamestown
University of Louisiana at Lafayette
University of Missouri - St. Louis
University of New Mexico
University of North Carolina Pembroke
University of North Dakota
University of Saint Mary
University of Texas - Pan American
University of Texas at Arlington
University of Texas at Austin
University of Texas at El Paso
University of Texas of the Permian Basin
University of Texas, Dallas
University of Texas, San Antonio
University of Texas, Tyler
Ursuline College
Walsh College of Accountancy and Business Administration
Warner University
Weber State University
West Chester University of Pennsylvania
Western Carolina University
Western Governors University
Western Michigan University
Western Nevada College
Westminster College (MO)
Westminster College (UT)
Wichita State University
Wichita State University, School of Engineering
Wiley College
William Peace University
William Woods University
Wisconsin Lutheran College
Yakima Valley Community

APPENDIX E: CLA+ TASKS

CLA+ includes one Performance Task (PT) and 25 Selected-Response Questions (SRQs). All items are administered online. Each PT consists of an open-ended prompt that asks students to provide a constructed response. Every SRQ presents students with four options and asks them to choose a single answer. The SRQs are further organized into three sets, each focusing on a different skill area.

Questions that appear on CLA+ call on students to use critical-thinking and written-communication skills as they perform cognitively demanding tasks. The integration of these skills mirrors the requirements of serious thinking and writing faced outside of the classroom.

Overview of the CLA+ Performance Task

Each PT asks students to answer an open-ended question about a hypothetical yet realistic situation. The prompt requires students to integrate analytical reasoning, problem solving, and written-communication skills as they consult materials in a Document Library and use them to formulate a response. The library includes a range of informational sources, such as letters, memos, summaries of research reports, newspaper articles, maps, photographs, diagrams, tables, charts, and interview notes or transcripts. Each PT is typically accompanied by four to nine documents, and students have 60 minutes to prepare their responses.

The first screen of each PT contains general instructions and an introduction to the scenario. The second screen is split. On the right side, students have a list of the informational sources in the Document Library. By using the pull-down menu, they can select and view each document. On the left side of the screen, students can read the question in the PT and enter their response in a field that has no word limit. An example of the split screen is shown on the following page.

Each PT assesses a unique combination of skills—no two are exactly the same. Some PTs ask students to identify, compare, and contrast the strengths and limitations of alternate hypotheses, points of view, courses of action, etc. Other PTs ask students to review a collection of materials and choose amongst a set of options to solve a problem or propose a new solution to the problem. Still other PTs ask students to suggest or select a course of action that

resolves conflicting or competing strategies and to provide a rationale for their decision, explaining why one approach is better than another. For example, students may be asked to anticipate potential difficulties or hazards associated with different ways of addressing a problem, propose likely short- and long-term consequences of these strategies, and defend one or more of these approaches.

PTs require students to utilize higher order thinking skills, more specifically, to

- recognize information that is relevant and not relevant to the task at hand;
- analyze and understand data in tables and figures;
- evaluate the credibility of various documents;
- distinguish rational arguments from emotional ones;
- determine the difference between fact and opinion;
- identify questionable or critical assumptions;
- deal with inadequate, ambiguous, or conflicting information;
- spot deception, possible bias, and logical flaws in arguments;
- identify additional information that would help resolve issues;
- weigh different types of evidence;
- organize and synthesize information from several sources; and
- marshal evidence from different sources in a written response.

Concluding Essay

Your task is to write a report evaluating Dr. Greer's claim that "reducing cell phone usage while driving motorized vehicles would lower the city's vehicle-related accident rate." Dr. Greer uses the chart in Document B to support his statement. Make sure to address the strengths and/or limitations of Dr. Greer's position and support your statement with information found in the documents.

There is no "correct" answer. Your report should clearly describe all the details necessary to support your position. Your answers will be judged not only on the accuracy of the information you provide, but also on how clearly the ideas are presented, how thoroughly the information is covered, how effectively the ideas are organized, and how well your writing reflects the conventions of standard written English.

While your personal values and experiences are important, please write your response solely on the basis of the information provided above and in the Document Library. Type your response in the space provided. Write as much as you need to fulfill the requirements on the task; you are not limited by the size of the response area on the screen.

[Copy]   [Paste]

Select document:
Document Library Contents
Document 1: Stoneville Police Department Data
Document 2: Dr. Greer's Chart

Document Library Contents

Document 1   Stoneville Police Department Data

Document 2   Dr. Greer's Chart

HELP   BACK   NE

Overview of the CLA+ Selected-Response Questions

Like the PT, the 25 SRQs measure an integrated set of critical-thinking skills. Students utilize these skills to answer three sets of questions. The first measures Data Literacy, the second measures critical reading and evaluation, and the third (critique an argument) measures students' ability to identify logical fallacies and questionable assumptions. This final set requires students to detect logical flaws and questionable assumptions. Also like the PT, each question set is document-based and includes one to three informational sources of varying natures. Students are instructed to use these materials when preparing their answers within the 30 minutes provided.

The first two question sets require students to draw on the information and arguments provided in accompanying materials. Each set contains 10 questions, for a total of 20 questions.

Supporting documents for the Data Literacy set discuss real-life research results. To answer questions in this section, students must apply critical-thinking skills that include

- making inferences and hypotheses based on given results,
- evaluating the reliability of information (such as experimental design or data collection methodology),

- identifying information or quantitative data that is connected and conflicting,
- detecting questionable assumptions (such as implications of causation based on correlation),
- supporting or refuting a position,
- drawing a conclusion or deciding on a course of action to solve a problem,
- evaluating alternate conclusions, and
- recognizing when a text has open issues that require additional research.

Supporting documents for the Critical Reading and Evaluation set present debates, conversations, and literary or historical texts with opposing views on authentic issues. To answer questions in this section, students apply critical-thinking skills that include

- supporting or refuting a position,
- analyzing logic,
- identifying assumptions in arguments,
- evaluating the reliability of information,
- identifying connected and conflicting information, and
- making justifiable inferences.

In the Critique an Argument set, students are presented with a brief argument about an authentic issue and asked to analyze the argument. To answer the five questions in this section, students must apply critical-thinking skills that include

- evaluating the reliability of information, including potential biases or conflicts of interest;
- detecting logical flaws and questionable assumptions;
- addressing additional information that could strengthen or weaken the argument; and
- evaluating alternate conclusions.

Assessment Development

CAE has a team of experienced writers who work with educational researchers and editorial reviewers to generate ideas and design carefully constructed performance tasks (PTs), selected-response questions (SRQs), and supporting documents. Each group contributes to the development and revision of these materials.

Throughout development, writers, researchers, and reviewers refine materials to ensure that each PT can support a variety of different approaches. The prompt must be sufficiently focused to guide students purposefully while providing them with the flexibility to demonstrate independent thinking. Questions must further be structured so students need to analyze and evaluate multiple sources of information from the Document Library to draw conclusions and justify their arguments.

Accompanying documents must present information in various formats and text types (e.g., tables, figures, news articles, editorials, emails, etc.). They must also provide enough information for students to formulate a number of reasonable arguments in response to the prompt. To achieve these goals, the development team drafts and revises a list of the intended content within each document. The list is used to check that each piece of information is clearly provided in the documents and that unwanted information is not embedded. During the editorial process, information is added and removed from the documents to ensure that students can reach approximately three to four different conclusions. Typically, some conclusions are better supported by available evidence than others.

The document list also serves as a starting point for scorer training and is used in alignment with analytic descriptions in the PT scoring rubrics. After several rounds of revisions, the most promising PTs are selected for piloting. During this stage, student responses are examined to identify any lack of clarity in the prompt or any unintentional ambiguity or unuseful information in the accompanying documents. After revisions are made, PTs that meet expectations by eliciting a full range and variety of responses become operational.

The development process for SRQs is similar to the one used for PTs. Writers create documents that are based on real-life data and topics and can support questions measuring higher-order thinking skills. When crafting these documents, writers present valid and invalid assumptions and conclusions, devise alternate hypotheses and conclusions, incorporate flawed arguments, and leave some issues intentionally unanswered. These characteristics serve as a foundation for the creation of SRQs.

When reviewing item sets, editors work with writers to confirm that correct answer options are in fact correct based on information provided in the documents. Editors and writers also ensure that incorrect answer options are not potentially plausible. Throughout this process, the development team also checks to make sure that questions assess the intended critical-thinking skills.

After several rounds of revision, the most promising SRQs are selected for piloting. During this stage, student responses are examined to identify any errors or lack of clarity in questions and answer options. Responses are also reviewed to check whether accompanying documents contain unintentional ambiguity or unuseful information.

After revisions are made, SRQs that function well—questions that are of appropriate difficulty and that effectively discriminate between high- and low-performing students—become operational.

APPENDIX F: SCORING CLA+

Student responses to Performance Tasks are scored in three skill areas: Analysis and Problem Solving, Writing Effectiveness, and Writing Mechanics. Students receive criterion-referenced subscores for each skill category based on key characteristics of their written responses.

Selected-Response Questions are scored based on the number of correct responses that students provide. Each of three question sets represents a skill area: Data Literacy (10 questions), Critical Reading and Evaluation (10 questions), and Critique an Argument (5 questions). Because some question sets may be more difficult than others, the subscores for each category are adjusted to account for these differences and reported on a common scale. See the appendix on Scaling Procedures for more information about the scaling process.

The Scoring Process

During the piloting of Performance Tasks (PTs), all student responses are double-scored. Human scorers undertake this process, and the documentation they assemble is later used to train more scorers and program the machine-scoring engine for operational test administrations.

CAE uses a combination of human and automated scoring for its operational PTs. Student responses are scored twice: once by a human scorer and once by the Intelligent Essay Assessor (IEA). This automated scoring engine was developed by Pearson Knowledge Technologies to evaluate textual meaning, not just writing mechanics. Using a broad range of CLA+ student responses and human-generated scores, Pearson has trained the IEA to evaluate CLA+ PTs in a manner that maintains consistency between human and automated scoring.

The rigorous training that candidates undergo to become certified CLA+ scorers further promotes the validity and reliability of the scoring process. Training sessions include an orientation to the prompts, scoring guides, and rubrics; extensive feedback and discussion after the evaluation of each student response; and repeated practice grading a wide range of student responses.

To ensure the continuous calibration of human scorers, CAE has also developed the E-Verification system for its online scoring interface. This system calibrates scorers by having them evaluate previously-scored responses, or "Verification Papers," throughout the scoring process. Designed to improve and streamline scoring, the E-Verification system periodically substitutes student responses with Verification Papers. These papers are not flagged for the scorers, and the system does not indicate when scorers have successfully evaluated them. However, if a scorer fails to assess a series of Verification Papers accurately, that scorer is targeted for additional coaching in a remediation process or is permanently removed from scoring.

Each student response receives three subscores in Analysis and Problem Solving, Writing Effectiveness, and Writing Mechanics. The subscores are assigned on a scale of 1 (lowest) to 6 (highest). Blank responses or responses unrelated to the task (e.g., what a student had for breakfast) are flagged for removal from test results.

Students also receive three subscores for the Selected-Response Questions (SRQs), one for each of the sets, which measure Data Literacy, Critical Reading and Evaluation, and Argument Critique. Unless a student fails to start the section or is unable to finish due to a technical glitch or connection error, any unanswered SRQs are scored as incorrect. However, if a student does not attempt at least half of the SRQs, the student will not receive a score for the section. Subscores are determined by the number of correct responses, adjusted based on item difficulty, and reported on a common scale. The adjustment ensures that scoring is consistent, for example, whether a student answers seven questions correctly in an easier set or six in a more difficult one.

Scores are equated so that each subscore category has the same mean and standard deviation and all test forms are comparable. Score values range from approximately 200 to 800 for each SRQ section.

APPENDIX G: MASTERY LEVELS

Setting Standards for CLA+

Following the creation of CLA+, a standard-setting study was conducted to establish fair and defensible levels of mastery for the new and improved assessment. This formal study was held at CAE headquarters in New York City on December 12, 2013. Twelve distinguished panelists, representing a variety of educational and commercial sectors, were invited to participate. The table below lists each panelist.

During the standard-setting study, panelists defined descriptions of three mastery levels: Basic, Proficient, and Advanced. A fourth level, Accomplished, was added in November 2014 using the same methodology and the same panelists. Panelists' discussions were based on the CLA+ scoring rubric as well as the knowledge, skills, and abilities required to perform well on CLA+. The purpose of this

activity was to develop consensus among the judges regarding each mastery level and to create a narrative profile of the knowledge, skills, and abilities necessary for CLA+ students. In Fall 2021, the Below Basic and Basic mastery levels were renamed as Emerging and Developing, respectively.

During subsequent rating activities, panelists relied on these consensus profiles to make item performance estimates. Judges broke into three groups of four, and each group evaluated characteristics related to one mastery level. The groups then reconvened and reported their findings to the group at large so they could form final consensus on student performance at each of the mastery levels.

CLA+ Standard-Setting Study Participant List and Institutional Affiliation

Participant	Institution
Aviva Altman	Johnson & Johnson
Jon Basden	Federal Reserve
Mark Battersby	Capilano University (Canada)
Paul Carney	Minnesota State Technical and Community College
Anne Dueweke	Kalamazoo College
Terry Grimes	Council of Independent Colleges
Sonia Gugga	Columbia University
Marsha Hirano-Nakanishi	California State University System
Rachel L. Kay	McKinsey & Company
Michael Poliakoff	American Council of Trustees and Alumni
Elizabeth Quinn	Fayetteville State University
Paul Thayer	Colorado State University

CLA+ Mastery Levels

CAE uses outcomes from the 2013 standard-setting study to distinguish between CLA+ students with varying knowledge, skills, and abilities as measured by the assessment. On individual reports, Mastery Levels are determined by students' Total CLA+ scores. On institutional reports, they are determined by each class level's mean Total CLA+ score.

Institutions should not use mastery levels for purposes other than the interpretation of test results. If an institution wishes to use the attainment of CLA+ mastery

levels as part of a graduation requirement or the basis for an employment decision, the institution should conduct a separate standard-setting study with this specific purpose in mind.

The following table summarizes each level of mastery and provides a description of students below the developing level of mastery.

Mastery Level	Description
Emerging	Students who are emerging do not meet the minimum requirements to merit a developing level of mastery.

Developing	Students at the developing level should be able to demonstrate that they at least read the documents, made a reasonable attempt at an analysis of the details, and are able to communicate in a manner that is understandable to the reader. Students should also show some judgment about the quality of the evidence. Students at the developing level should also know the difference between correlation and causality. They should be able to read and interpret a bar graph, but not necessarily a scatter plot or comprehend a regression analysis. Tables may be out of reach for developing students as well.
Proficient	Students at the proficient level should be able to extract the major relevant pieces of evidence provided in the documents and provide a cohesive argument and analysis of the task. Proficient students should be able to distinguish the quality of the evidence in these documents and express the appropriate level of conviction in their conclusion given the provided evidence. Additionally, students should be able to suggest additional research and/or consider the counterarguments. Minor errors in writing need to be defined rigorously. Proficient students have the ability to correctly identify logical fallacies, accurately interpret quantitative evidence, and distinguish the validity of evidence and its purpose. They should have the ability to determine the truth and validity of an argument. Finally, students should be able to know when a graph or table is applicable to an argument.
Accomplished	Students at the accomplished level of mastery should be able to analyze the information provided in the documents, extract relevant pieces of evidence, and make correct inferences about this information. Accomplished students should be able to identify bias, evaluate the credibility of the sources, and craft an original and independent argument. When appropriate, students will identify the need for additional research or further investigation. They will refute some, but not all of the counterarguments within the documents and use this information to advance their argument. Accomplished students also have the ability to correctly identify logical fallacies, accurately interpret and analyze qualitative and quantitative evidence (e.g., graphs and charts), and incorporate this information into their argument. Students will be able to correctly identify false claims and other sources of invalid information and integrate this information in their responses. Student responses are presented in a cohesive and organized fashion. There may be infrequent or minor errors in writing fluency and mechanics, but they will not detract from the reader's comprehension of the text.
Advanced	Students at the advanced level demonstrate consistency, completeness, and show a command of the English language in their response. They have a level of sophistication that is not seen in the proficient or developing levels. Advanced students create and synthesize the provided evidence, are comfortable with ambiguity, are able to structure their thoughts, understand causality, add new ideas, and introduce new concepts in order to create or seek new evidence. They think about conditions and nuances and express finer points and caveats by proposing a conditional conclusion. The students at this level display creativity and synthesis, while understanding the finer points in the documents. For example, advanced students will be able to synthesize the information across multiple documents and address the ambiguities in the data that are presented, such as outliers and knowing how sample size affects

outcomes. Advanced students will also be able to identify and highlight gaps in logic and reasoning.

APPENDIX H: DIAGNOSTIC GUIDANCE

Interpreting CLA+ Results

CLA+ test results can be used to evaluate an institution's overall performance on tasks measuring higher-order thinking skills. Test results can also be used to determine an individual student's areas of relative strength and weakness.

Examining performance across both CLA+ sections can serve as a comprehensive diagnostic exercise since the combination of necessary knowledge, skills, and abilities differs for the Performance Task (PT) and the Selected-Response Questions (SRQs). The PT measures Analysis and Problem Solving, Writing Effectiveness, and Writing Mechanics, while the SRQs measure Data Literacy, Critical Reading and Evaluation, and Critique an Argument (the detection of logical flaws and questionable assumptions).

SRQ subscores are assigned based on the number of questions answered correctly; this value is then adjusted to account for item difficulty, and the adjusted value is converted to a common scale. Established in relation to the test performance of freshmen in the fall of 2013, the scale has a mean of 500 and a standard deviation of 100. SRQ subscores thus range from approximately 200 to 800.

PT subscores are assigned on a scale of 1 (lowest) to 6 (highest). Unlike the SRQ subscores, PT subscores are not adjusted for difficulty. These subscores remain as is

because they are intended to facilitate criterion-referenced interpretations. For example, a score of "4" in Analysis and Problem Solving signifies that a response has certain qualities (e.g., "Provides valid support that addresses multiple pieces of relevant and credible information..."). Any adjustment to the score would compromise this interpretation.

The ability to make a claim such as, "Our students seem to be doing better in Writing Effectiveness than in Analysis and Problem Solving," is clearly desirable. These types of observations can be made by comparing the distributions for each subscore in Section 4 of your institutional report (specifically, on page 5). P

CLA+ Mastery Levels further contextualize PT and SRQ subscores by interpreting test results in relation to the qualities exhibited by examinees. Each Mastery Level corresponds to specific evidence of critical-thinking and written-communication skills. Please see the appendix on Mastery Levels for detailed information about each Mastery Level.

Comparing Results Across Administrations

One way to assess institutional performance is to track changes in CLA+ test scores over time. This goal can be achieved by testing a cohort of students longitudinally or by participating regularly in cross-sectional CLA+ administrations.

The CLA+ assessment format differs from that of its predecessor, the CLA. Therefore, direct score comparisons are not feasible for test data collected before and after fall 2013. However, scaling equations can be used to adjust CLA scores for the purpose of making comparisons with CLA+.

Schools wishing to relate current CLA+ test results to CLA results in previous years can use the following equation, derived by comparing the CLA and CLA+ total scores from 132 institutions that tested students on both forms of the assessment (r=0.881):

CLA scores from fall 2010 – spring 2013:
$score_{CLA+} = 204.807 + (0.792 * score_{CLA})$

CLA scores from before fall 2010:
$score_{CLA+} = 212.908 + (0.673 * score_{CLA})$

In addition to making direct score comparisons across earlier test administrations, schools can also use their percentile rankings to determine changes in performance relative to other CLA+ institutions.

Importantly, all test administrations after fall 2013 will be readily comparable. The institutional sample used for setting norms (percentile rankings, value-added parameters, etc.) will be fixed as of the 2013-14 academic year. So, any changes in value-added score or percentile ranking can now be attributed to a school's CLA+ test results rather than potential shifts in the norming sample.

APPENDIX I: SCALING PROCEDURES

Converting CLA+ Scores to a Common Scale

To provide CLA+ Total Scores, CAE converts PT and SRQ Scores to a common scale of measurement. This process allows us to combine score values from the two different assessment tasks.

For each Performance Task (PT), the three subscores are added to produce a raw section score. The raw section score is then converted to a common scale of measurement, yielding a scaled section score. The conversion produces scale scores that maintain comparable levels of proficiency across performance tasks and test forms. So, for example, a CLA+ PT Score would indicate the same percentile rank regardless of the task a student received.

For the PT, CAE uses a linear transformation when converting raw scores to scale scores. The process creates a scale score distribution for CLA+ freshmen that has the same mean and standard deviation as their combined SAT Math and Critical Reading (or converted ACT) scores. The transformation was defined using data from college freshmen who took CLA+ in fall 2013. This type of scaling preserves the shape of the raw score distribution and maintains the relative standing of students. For example, the student with the highest raw score on a PT will also have the highest scale score for that task, the student with the next highest raw score will be assigned the next highest scale score, and so on.

This scaling practice ensures that a very high PT raw score (not necessarily the highest possible score) corresponds approximately to the highest SAT (or converted ACT) score earned by a freshman testing in fall 2013. Similarly, a very low PT raw score would be assigned a scale score value close to the lowest SAT (or converted ACT) score earned by a freshman taking CLA+ in fall 2013. On rare occasions when students earn exceptionally high or low raw PT scores, their scale scores may fall outside the normal SAT Math and Critical Reading score range of 400 to 1600.

For the Selected-Response Questions (SRQs), the raw subscores (for the three skill categories measured by the three question sets) are determined based on the number of correct responses. These raw subscores are first equated and then placed on a common scale. This process adjusts the subscores based on the difficulty of the item sets so the subscores have the same mean and standard deviation across all question sets. Comparisons can then be made across test forms.

Using a linear transformation, CAE then converts the equated subscores to a more interpretable scale with a mean of 500 and standard deviation of 100, again, based on data from freshmen taking CLA+ in fall 2013. This scale produces SRQ subscores ranging from approximately 200 to 800, similar to the subsections of the SAT.

The weighted average of the SRQ subscores is then transformed again, using the same scaling parameters as the PT. As before, the process creates a scale score distribution for CLA+ freshmen that has the same mean and standard deviation as their combined SAT Math and Critical Reading (or converted ACT) scores. The transformation is based on data from college freshmen who took CLA+ in fall 2013. The application of common parameters places both CLA+ section scores on the same scale.

Finally, CLA+ Total Scores are calculated by taking the average of the CLA+ PT and SRQ Scores. Thus, students who do not complete or provide scorable responses for both sections of the assessment do not receive CLA+ Total Scores.

APPENDIX J: MODELING DETAILS

Modeling Student-Level Scores

When determining value-added scores on the student level, an equation like the one below is used to model the relationship between parental education of senior students and their CLA+ scores:

$$CLA_{ij} = \overline{CLA}_j + 6.28(EDU_{ij} - \overline{EDU}_j) + r_{ij}$$

In this equation, CLA_{ij} represents the CLA+ score of senior student i in school j. This value is modeled as a function of two variables: (1) school j's mean senior CLA+ score $(\overline{CLA}_j)$ and (2) student i's parental education score (EDU_{ij}) minus the average parental education score of all participating seniors at school j $(\overline{EDU}_j)$. The final component of the equation is a residual term r_{ij}, which is equal to the difference between the senior student's observed and expected CLA+ performance.

The student-level regression coefficient for parental education is 6.28 in this equation, which indicates that for every 1 year increase in parental education, one would expect to see a 6.28-point increase in CLA+ performance.

To illustrate the use of this equation for computing a student's expected CLA+ score, consider a school with a mean senior CLA+ score of 1050 and a mean parental education score of 12 years. A senior student in this school whose higher-educated parent graduated with a bachelor's degree or other four-year equivalent would be expected to have a CLA+ score of

$$1050 + 6.28(16 - 12) + 0 = 1075.$$

For residual term r_{ij}, 0 indicates no difference between observed and expected performance, while positive numbers denote "better than expected" performance and negative numbers denote "worse than expected" performance. Residuals are always expected, on average, to equal 0 for any given student. So, if this student actually scored an 1100 on CLA+, then residual term r_{ij} would be 15 instead of 0 because this student would have scored 15 points higher than one would expect given his or her parental education.

Modeling School-Level Scores

Using hierarchical linear modeling (HLM), value-added scores on the school level are derived using an equation such as the following:

$$\overline{CLA}_j = 236.25 + 0.44(\overline{fCLA}_j) + 28.81(\overline{EDU}_j) + u_j$$

In this equation, $\overline{CLA}_j$ represents the mean senior CLA+ score at school j, $\overline{fCLA}_j$ represents the mean freshman CLA+ score at school j, $\overline{EDU}_j$ represents the mean parental education of the seniors at school j, and u_j is school j's residual term, which is its unstandardized value–added score. More specifically, u_j is the difference between that school's observed and expected mean senior CLA+ scores. In this equation, 236.25 is the intercept of the equation and does not have a substantive interpretation. The regression coefficient 0.44 represents the expected increase in mean senior CLA+ score for each 1-point increase in that school's mean freshmen score, and 28.81 represents the expected increase in mean senior CLA+ score for each 1-year increase in that school's mean parental education level.

Use of freshman CLA+ scores as a predictor of the mean senior CLA+ score is crucial in order to establish a "baseline" of performance at each school. Additionally, a multitude of research has consistently shown that sociodemographic variables are strongly linked to educational and academic outcomes. In our equations, we use parental education as a proxy for these types of variables. Parental education has been shown to be important on its own, not just as a proxy, so its role in these equations is very valuable.

To illustrate the use of this equation for estimating a school's value-added scores, consider a school with an average freshman CLA+ score of 1000 and an average parental education score of 12 years. According to the school-level equation, one would expect the mean senior CLA+ performance at this school to be:

$$236.25 + (0.44 * 1000) + (28.81 * 12) + 0 = 1022.$$

However, if the observed average senior CLA+ performance was actually 1050, then the difference in observed and expected senior CLA+ performance at this school would be +28 points. Once converted to a standard scale, the value-added score for this school would be 0.64, which would place the institution in the "Near Expected" performance level.

To expand on the significance of value-added scores and their proper interpretation, consider a group of CLA+ schools whose students have a similar set of academic skills upon entering college and who are also demographically similar to each other. If the seniors at one school in this group performed better than expected according to this model, while the seniors at the other schools performed at expectation (i.e., the other schools had value-added scores near 0), one could infer that greater gains in critical thinking and written communication occurred at this school. That is, the school may have added greater value to its students' educational experience over the course of four years.

The major goal of value-added modeling is to obtain a benchmark of student performance based on

demonstrated ability at the time of college entrance and to identify schools admitting similar students by applying this criterion. It is important to understand the types of comparisons that can be made using value-added scores as well as their limitations. For instance, a high value-added score does not necessarily indicate high absolute performance on CLA+. Schools with low absolute CLA+ performance may obtain high value-added scores by performing well relative to expectation (i.e., relative to the average performance of schools testing students with similar academic skills upon college entrance). Likewise, schools with high absolute CLA+ performance may obtain low value-added scores by performing poorly relative to expectation. Importantly, though it is technically acceptable to interpret value-added scores as relative to all other CLA+ schools after controlling for student characteristics, this approach is not advisable because it encourages false comparisons among disparate institutions.

Interpreting Confidence Intervals

Value-added scores are estimates of unknown quantities, or "best guesses" based on reported information. Given their inherent uncertainty, these estimates must be interpreted in light of available information about their precision. Value-added estimation using hierarchical linear modeling (HLM) provides standard errors which can be used to compute a 95% confidence interval for each school. These standard errors reflect variation in parental education and CLA+ scores within and between schools and are most strongly related to senior sample size. Schools testing larger samples have smaller standard errors and corresponding 95% confidence intervals—and therefore obtain more precise value-added estimates.

To illustrate the relationship between these components of estimation, let us return to the example school with a value-added score of 0.64. If the senior sample size at this institution was 100, the school would have a standard error of 0.34. The 95% confidence interval for this school would thus range from -0.03 to 1.31, which is calculated as: 0.64 ± (1.96 * 0.34). The confidence interval would have been much larger if this school tested only half as many students. Alternatively, it would have been much smaller if the school tested twice as many students. Larger confidence intervals denote less precise estimation, while smaller confidence intervals denote more precise estimation.

Statistical Specification of the CLA+ Value-Added Model

Level 1 (Student Level): $CLA_{ij} = \beta_{0j} + \beta_{1j}(EDU_{ij} - \overline{EDU}_j) + r_{ij}$

- CLA_{ij} is the CLA+ score of student i at school j.
- EDU_{ij} is the parental education of senior i at school j.
- $\overline{EDU}_j$ is the mean parental education of all seniors at school j.
- β_{0j} is the student-level intercept (equal to the mean CLA+ score at school j).
- β_{1j} is the student-level regression coefficient for parental education at school j.
- r_{ij} is the residual for senior i in school j, where r&subij; has a normal distribution with mean 0 and variance σ^2, and σ^2 is the variance of the student-level residuals (the pooled within-school variance of CLA+ scores after controlling for parental education).

Level 2 (School Level): $\beta_{0j} = \gamma_{00} + \gamma_{01}(\overline{fCLA}_j) + \gamma_{02}(\overline{EDU}_j) + u_j$

- $\overline{EDU}_j$ is the mean parental education score at school j.
- $\overline{fCLA}_j$ is the mean freshman CLA+ score at school j.
- β_{0j} is the student-level intercept (equal to the mean CLA+ score at school j) given in the previous equation.
- γ_{00} is the school-level intercept.
- γ_{01} is the school-level regression coefficient for freshman mean CLA+ scores.
- γ_{02} is the school-level regression coefficient for senior mean parental education.
- u_j is the school-level residual for school j (i.e., the unstandardized value-added score), where u&subj; has a normal distribution with mean 0 and variance τ_{00}.

Estimated Parameters for the Value-Added Model

	γ_{00}	γ_{10}	γ_{01}	γ_{02}	Standard Deviation
Total Score	108.08	6.97	0.66	21.11	43.56
PT Score	118.34	5.73	0.60	23.60	52.50
SRQ Score	96.67	8.20	0.69	20.01	43.71

The table above shows the estimated parameters for the CLA+ value-added model. Using these parameters and the

instructions below (or the statistical models on the previous page), you will be able to compute the expected senior CLA+ score for your institution. In combination with the observed mean score for seniors at your school, you can then calculate your school's value-added score. Using these values, you can also perform subgroup analyses or make value-added estimates for student groups with longitudinal data.

How to Calculate CLA+ Value-Added Scores

To calculate value-added scores for your students, you will need:

- Samples of entering and exiting students with parental education and CLA+ scores (See your CLA+ Student Data File.)
- The estimated parameters for the value-added model (See the table above.)

1. Refer to your CLA+ Student Data File to identify your subgroup sample of interest. The subgroup must contain freshmen with CLA+ scores and seniors with parental education scores and CLA+ scores.
2. Using your CLA+ Student Data File, compute:
   - The mean parental education of seniors (exiting students) in the sample. Use the below table for help with this.
   - The mean CLA+ score of freshmen (entering students) in the sample.
   - The mean CLA+ score of seniors (exiting students) in the sample.
3. Calculate the senior sample's expected mean CLA+ score, using the parameters from the table above. Please note that the same equation can be used for each CLA+ section score and for the Total CLA+ score

as well by selecting the appropriate parameter values and inserting them into this equation:

Expected Score = γ_{00} + γ_{01}(freshman mean CLA+ score) + γ_{02}(senior mean parental education)

4. Use your expected score to calculate your unstandardized value-added score:
   Value-added Score, unstandardized = (Observed senior mean score) - (Expected senior mean score)

5. Convert the unstandardized value-added score into a standardized value-added score:
   Value-added Score, standardized = (Value-added score, unstandardized) / (Standard Deviation)

To use parental education when computing your school's value-added score, you must convert each student's parental education score from the "Old Value" column to the "New Value" column, then take the average across the resulting values. Omit students who do not have valid scores (scores of NA; essentially, these students do not count in any part of these calculations, even in computing the sample size).

Level of Education	Old Value	New Value
Less than high school	1	10
High school diploma or equivalent	2	12
Some college but no Bachelor's degree	3	14
Bachelor's degree or equivalent	4	16
At least some graduate work	5	18
Don't know or NA	6	NA
Note. Students who respond "Don't know" to parental education must be removed from the analysis before calculating mean parental education or any mean CLA+ scores.		

APPENDIX K: PERCENTILE LOOK-UP TABLES

Percentile Look-Up Tables for CLA+ Scores

For schools interested in the distribution of CLA+ performance, CAE provides percentile tables that list scores for total CLA+, as well as each section of the examination (PT and SRQs), all associated with a percentile value.

Percentiles are calculated at both the institution-level and the student-level. Please contact CAE support if you are interested in viewing the percentile rank tables.

APPENDIX L: STUDENT DATA FILE

Exploring Student Data

In tandem with your institutional report, CAE provides a CLA+ Student Data File, which gathers content from three sources: CLA+ scores and identifiers computed by CAE, academic data and demographic information provided by your registrar, and self-reported information from your students' CLA+ online profiles and post-assessment surveys. Each piece of data in the spreadsheet is identified as a separate variable.

The Student Data File contains information identifying each student and the test administrations being reported. Here, you will also find testing times and a full range of scoring information, such as Performance Task (PT) subscores and section scores, Selected-Response Question (SRQ) subscores and section scores, and Total CLA+ scores. Other scoring information includes performance levels and percentile ranks for each section and the test as a whole, and overall mastery levels.

The data file provides student demographic information as well, including student responses to new survey questions regarding how much effort they put into each CLA+ section and how engaging they found these sections to be. Student responses may help contextualize individual scores and institutional results. These responses may also help schools identify motivational issues within participant groups, so schools can adjust their outreach and recruitment methods for future administrations.

Local Survey is a tool that allows institutions to add as many as nine questions of their own to the post-assessment survey. If an institution uses the Local Survey feature within the CLA+ testing platform, responses to these questions will also appear in the Student Data File. The set of combined questions allows schools to create a richer, customized collection of data to facilitate institutional research using CLA+.

You may link the student-level information in this file with other data you collect—for example, from the National Survey of Student Engagement (NSSE), the Cooperative Institutional Research Program (CIRP), or from local portfolios, assessments, or studies of course-taking patterns, specialized program participation, etc. The gathered information can help you hypothesize about a range of factors related to institutional performance.

Student-level scores were not originally designed to serve a diagnostic purpose at the individual level. However, with the advent of CLA+, these scores have greater utility. Student-level results can now be used for formative purposes, to identify areas of weakness for individual students and to help determine performance issues across participant groups. Schools may analyze the performance of student subgroups to determine whether certain students may benefit from targeted educational enhancements. Value-added scores may be estimated for these subgroups as well and compared to growth estimates across the institution.

Starting with the fall 2013 administration, student-level CLA+ results can now be compiled from year to year, yielding a larger and much richer data set than one gathering results from a single academic year. Student data aggregated across years will allow schools to track performance longitudinally so they can identify improvements in critical thinking and written communication made by their students.

APPENDIX M: MOVING FORWARD

What Next?

The information presented in your institutional report is designed to help you better understand the contributions your school has made toward student learning. Yet, the report alone provides only a snapshot of student performance. By combining it with other tools and services that CLA+ has to offer, the institutional report can become part of a powerful evaluation and enrichment strategy. It can help you and your school target specific areas of improvement and align teaching, learning, and assessment effectively to enhance student performance over time.

We encourage institutions to examine CLA+ performance closely and review the results carefully with their educators. Schools can extend these analyses by linking student-level CLA+ outcomes with other data sources and pursuing in-depth sampling. Collaboration with peer schools and participation in professional development opportunities can support institutions and their educators further by showing how research findings can inform teaching practices and help improve student learning.

Using your Student Data File, you can relate student-level CLA+ results to data you collect on course-taking patterns, grade achievement, and other topics of inquiry. CLA+ subscores in Analysis and Problem Solving, Writing Effectiveness, Writing Mechanics, Data Literacy, Critical Reading and Evaluation, and Critique an Argument can contribute to analyses of portfolios, student surveys, and other sources by helping you focus on specific areas that may benefit from improvement. Internal analyses conducted through in-depth sampling can help you generate hypotheses and develop a basis for additional research.

CLA+ can offer peer group comparisons, but the true strength of peer learning comes through collaboration. CAE facilitates cooperative relationships among CLA+ schools by encouraging the formation of consortia. Moreover, CAE hosts web conferences that periodically feature campuses engaged in promising work with CLA+.

CAE also provides workshops geared toward helping institutions maximize the utility of their Student Data Files. In these sessions, CAE researchers work with institutional staff, showing them ways to dig deeper into student results so they can answer questions about performance on CLA+ and identify areas of strength or weakness. To reserve one of these sessions for your institution, please email clateam@cae.org.

Finally, our professional development services shift the focus from assessment outcomes to pedagogical tools in Performance Task Academies. These two-day, hands-on training workshops offer faculty members guidance in the creation of their own performance tasks. Modeled on the structure of CLA+ tasks and designed to support the teaching objectives of individual courses, faculty-developed tasks can be used as classroom exercises, homework assignments, or even local-level assessments. To learn more about Performance Task Academies, please consult the CAE website.

In all these ways, we encourage institutions to explore a system of continuous improvement driven by the diagnostic potential of CLA+. When used in combination, our programs and services reinforce the belief that institutions must connect teaching, learning, and assessment in authentic and meaningful ways to strengthen and advance their students' higher-order thinking skills.

Without your contributions, CLA+ would not be on the exciting path it is on today. We thank you for your participation and look forward to your continued involvement!

CAE