College of Business and Economics

Collegiate Learning Assessment Report:

Preliminary findings of results from testing 2011-2013

September 19, 2013

Summary

The College of Business and Economics is using the Collegiate Learning Assessment (CLA) test to assess higher-order skills, including critical thinking and written communication. This assessment tool was first employed fall 2011. Spring 2014 will end the three-year pilot test of this assessment tool. This report offers a preliminary assessment of the first two year's results. Overall, the results suggest senior business student's actual performance is better than expected performance. The point spread between actual and expected values is greater than 90 percent of schools taking the test. Expected values are based on a combination of their SAT scores and freshmen test results. Performance Task performance results are in the 95th percentile suggesting the College's efforts to integrate critical thinking into the curriculum appears to be on track. Analytic writing scores are lower, suggesting less value-added skills transferred from the College. Specifically, results show seniors do not demonstrate strong ability to state a thesis and provide compelling support. Seniors score better at examining key elements include identifying logic flaws, and explaining how the flaws affect the argument's conclusion. While these results offer guidance for curriculum development, concerns about the sample size and institutional challenges suggest the results be interpreted with some caution.

The College of Business and Economics at the University of Hawaii at Hilo (UHH) began as a business major program in 1975 in the College of Arts and Sciences. The program became an independent College in 2004 and achieved initial accreditation by AACSB in 2005. The College offers Economics and Business Administration Bachelors' degrees with Accounting, and General Management majors.

The College's outcome assessment started in the early 1990's and remains a dynamic process. Since 2011, the College has used the Collegiate Assessment Learning (CLA) examination to measure writing and complex problem-solving skills. CLA uses construct-response tasks and value-added methodology reflecting analytic reasoning and evaluation, writing effectiveness, writing mechanics, and problem solving. These test elements help assess the College's Program Learning Goals #3 and #5. Program Learning Goal #3 states graduates should demonstrate skill in expressing ideas clearly, logically, and persuasively in written communications. Program Learning Goal #5 states graduates should demonstrate the ability to analyze complex, unstructured qualitative and quantitative problems using appropriate tools and technology.

Currently, the College is collecting data for the third year and final year of a pilot program. The CLA offers a comparative assessment tool with more than 172 universities testing students with senior standing in 2012. This report provides results from testing during the 2011-2012 and 2012-2013 academic school years. Freshmen students are tested during fall terms. These students are incoming freshmen with no college credit hours. First-year students are chosen randomly and represent a cross-section of study areas. Senior business and accounting

students are tested during spring terms. These students typically are enrolled in the business capstone course (Business 490).

Overall CLA Scores

CLA test results are scaled to college entrance examinations. Participating universities provide SAT or ACT test scores for students that took the tests, serving as a proxy for the "Expected CLA Score". Figures 1 and 2 show Total CLA Scores for seniors during spring 2012 and 2013 terms. These results show graduating business students performing better than expected, suggesting the University and College provide considerable value-added education.
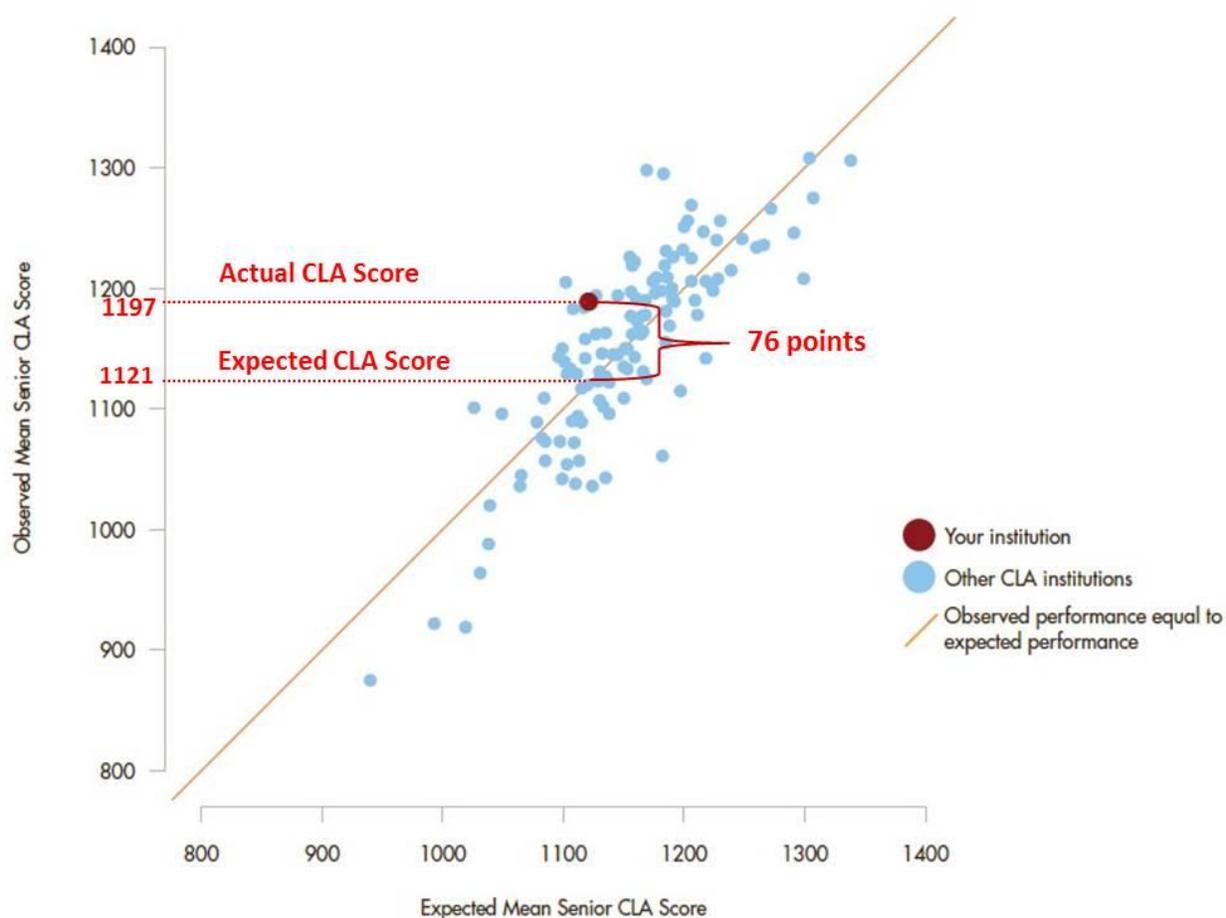

Figure 1. Actual versus expected test results: Comparing CLA to student SAT scores 2011-2012 (n=172 universities)
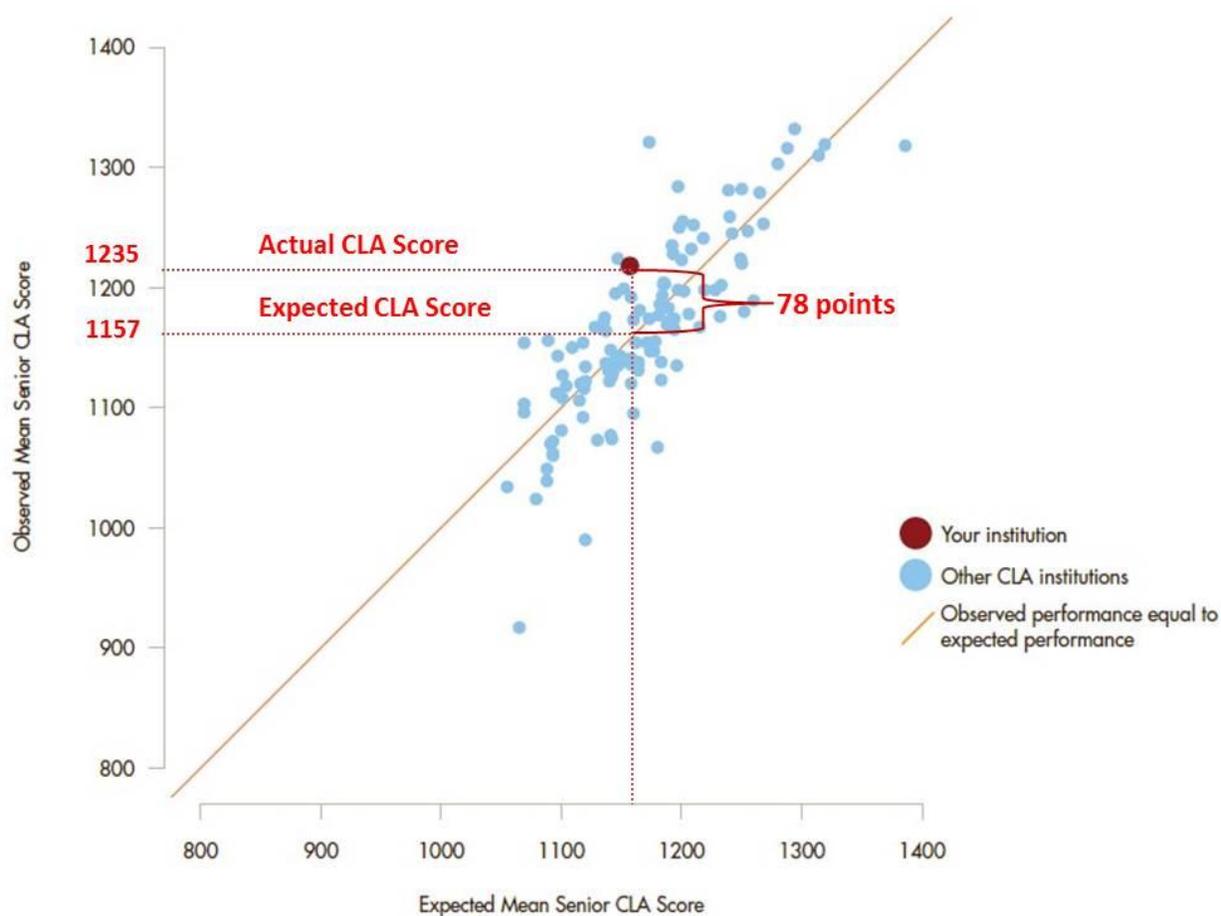
Figure 2. Actual versus expected test results: Comparing CLA to student SAT scores 2012-2013
  (n=155 universities)

Caveats

Added value scores need to be interpreted with some caution. Transfer students with 24 credit hours need not submit SAT or ACT scores for admission to UH-Hilo. For seniors taking the 2012 and 2013 CLA test, the University does not have records for 32 percent and 36 percent respectively because they did not submit their standardized test scores with their admission applications. Should the CLA continue to be used as an assessment tool, identifying these

transfer students prior to testing and including the 30-minute SLE portion of the assessment will increase the degrees of freedom. The SLE serves as a proxy for the SAT or ACT scores. The additional scores may not affect the overall findings; however, the sample size is one-third smaller for value-added calculations. Value-added results provide important assessment of areas for improvement a large sample would increase confidence in the findings.

The CLA has a 90-minute time limit to complete the online writing assessment. Students typically finish the test before time expires. Raw data include an overall CLA score, a Performance Task or a combination of one Make-an-Argument and one Critique-an-Argument prompt. Additionally, the raw data include the amount of time each student spends taking the test.

Preliminary data analysis shows several students spent little time taking the test (e.g., 9 minutes). As these data points unlikely offer a complete assessment of students' abilities, histograms were run on the four data sets. The histograms show a nice break between less than 30 minutes versus 30 minutes or more. Students spending less than one-third the time allotted unlikely spent much time process information and articulating answer that measure their abilities. Further, most UH seniors spent at least 45 minutes taking the test (69% in 2011; 88% in 2012). Except for the fall 2011 test (27 omitted), a relatively small number of test scores were omitted: spring 2012 (4); fall 2012, (2); and spring 13, (1). As the fall 2011 test had 29 student scores over the 100 student requirement, using the 30-minute cut-off retains an adequate sample.

Adjusted CLA Results

Using the cleaned data, additional analysis on the results offers greater insights on student performance. Table 1 shows the Total CLA scores for UH-Hilo compared to the national average. The blue dot represents the average and the black line bisecting the gray box is the median scores. The boxes upper line represents the cutoff for the third quartile and the boxes bottom line is the cutoff for the second quartile. The whisker lines show the variation with the endpoints at the minimum and maximum scores. Overall test scores increased from 2011 to 2012. Most encouraging is the finding is that the bottom end of the score range increased by 267 points.

Table 1. Total CLA scores
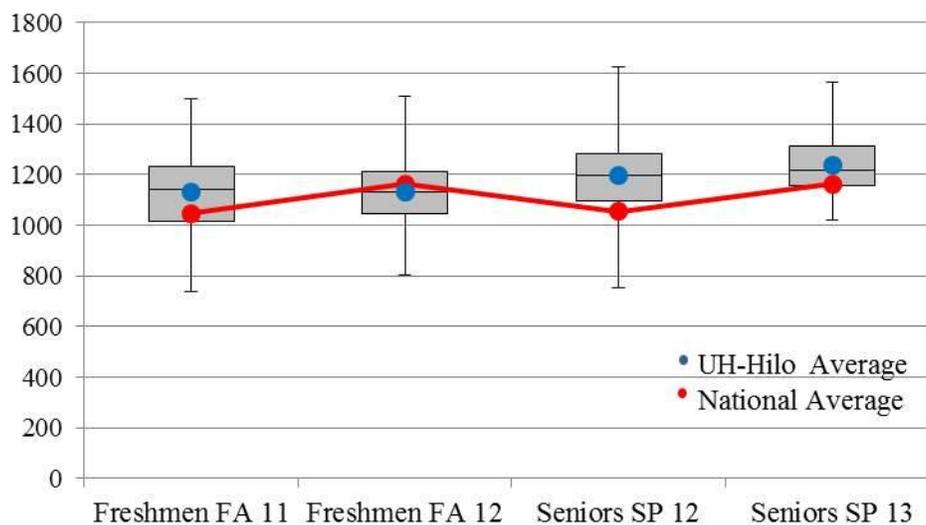
UH-Hilo Samples: Freshmen 2011 (n=102); Freshmen 2012 (n=48); Seniors 2012 (n=47); Seniors 2013 (n=32)
Composite National Averages (number of universities): Freshmen 2011 (n=169); Freshmen 2012 (n=161); Seniors 2012 (n=172); Seniors 2013 (n=155)

The value-added score is calculated by subtracting the observed senior mean CLA score from the expected senior mean CLA score and dividing the difference by the standard deviation.

The expected senior mean CLA score is a bit more complicated to calculate, requiring some base numbers form the test developer (Council for Aid to Education).[1]

Value-added scores are standardized and assigned performance levels. These scores are like Z-scores in statistics and sample size affects the interpretation of confidence intervals. A range between -1.00 and +1.00 classify as "near expected," +1.01 and +2.00 are "above expected," and above +2.01 and below -2.01 are classified as "well above expected" and "well below expected" respectively. Generally, value-added scores above 2.00 suggest the school's students performed in the 98th or 99th percentile.

Using the cleaned data, the results are slightly lower. For both testing periods, the difference between actual and expected CLA scores is just over 66 points, 10-12 points lower than the Institutional Report scores. Cleaning the data apparently removes some lower freshmen CLA scores resulting in a lower value added score. The average CLA scores for freshmen cleaned from the data are 964.59, considerably lower than the average for the students that spent 30 minutes or more taking the test (1133.71). The standardized value added scores are 1.33 (2012 seniors) and 1.27 (2013 seniors), suggesting an "above expected" rating overall. Both value-added scores place the College in the 93rd percentile nationally. Using the raw data, the ranking remains the same for 2011, but the ranking for 2012 slips slightly to the 91st percentile.

These results do not suggest that UH students scored in the top decile nationally. Instead, the correct interpretation is that the gap between the expected scores (measured by SAT or ACT results) and actual score (the CLA test score) have a larger gap than most universities taking the

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[1] Expected senior mean CLA = γ_{00} + γ_{01} (senior mean EAA) + γ_{02} (freshmen mean CLA), where γ_{00} = school-level value-added equation intercept, γ_{01} = school-level value-added equation slope for senior mean EAA (SAT or converted ACT score), and γ_{02} = school-level value-added equation slope for the freshmen mean CLA.

test. Some institution-specific issues (see conclusion) also dictate cautious interpretation of the results.

CLA Categories and Subcategories

Performance Task

Performance Task requires students to integrate critical thinking, analytic reason, problem solving, and written communication skills to answer open-ended questions about realistic situations. Students receive a range of information including letters, memos, research report summaries, newspaper articles, maps, tables, and charts. This information informs the students' answers to questions. Table 2 shows results of the Performance Task Assessment. Findings show both freshmen and seniors perform better than the national average. As with the over CLA scores, these result also show the second year's testing has smaller variation and upward trends.

The cleaned data show a greater differential between expected and actual Performance Task scores in 2013 (127.51 points) versus 2012 (105.43 points). The standardized value-added scores are 1.75 (2012 seniors) and 1.93 (2013 seniors), suggesting an "above expected" rating overall. Both raw and adjusted data results suggest Performance Task performance well above the 95th percentile nationally.   The evidence suggests the College's efforts to integrate critical thinking into the curriculum appears to be helping students to make substantial progress.

Table 2. Performance task
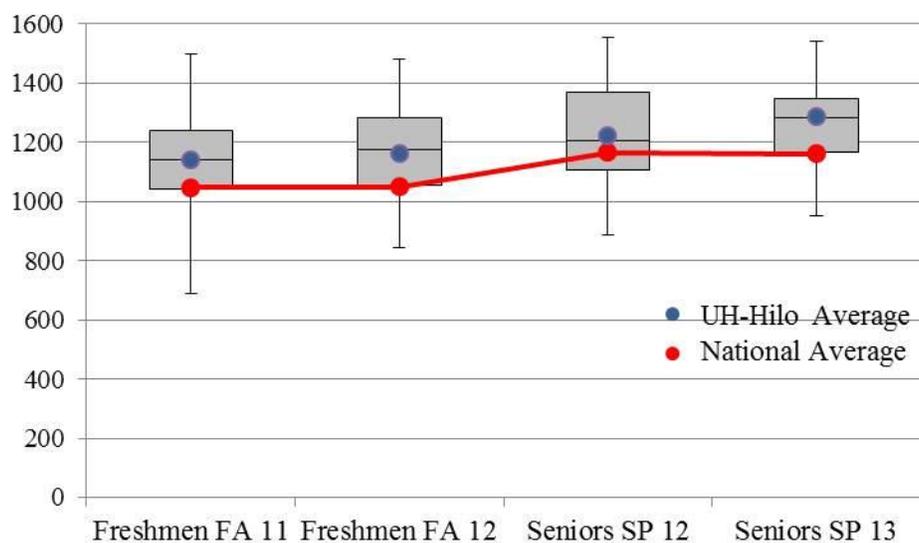
Analytic Writing

Students answer two types of essays—Make-an-Argument and Critique-an-Argument. Make-an-Argument requires students to support or reject a position on some issues. Critique-an-Argument tests the student's ability to evaluate another person's argument. These tasks measure the ability to articulate complex ideas using standard, written English. Tables 3-5 show results of these task measures compared to the national averages. While the results show UH-Hilo students score at about the national average, the vertical axis suggests this area is lower than Performance Task.

The cleaned data show a slight differential between expected and actual Analytic Writing Task scores is marginal—2012 (16.1 points) and 2013 (4.1 points). The standardized value-added scores are 0.32 for 2012 seniors (63rd percentile) and 0.08 for 2013 seniors (51st percentile), receiving an "expected" rating. These results suggest the University and College

offer limited added-value in this area and provide an area to target for future curriculum development.

**Table 3. Analytic writing task**
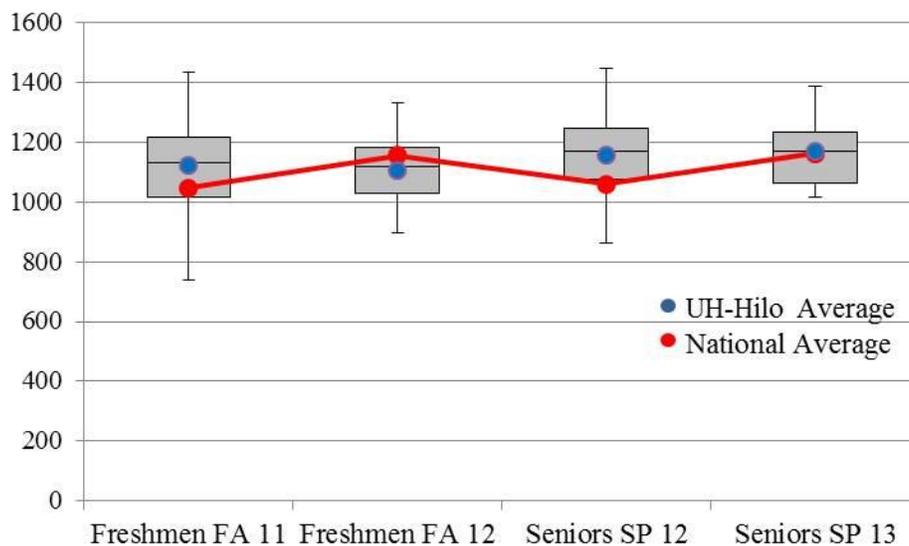
Make-an-Argument

The Make-an-Argument prompt presents an opinion and asks the student to write a persuasive, analytic essay to support the position in 45 minutes. Key elements include establishing the issue's thesis or opinion, maintaining a consistent position on the issue, supporting the thesis with relevant and persuasive examples, and considering plausible alternative viewpoints. Writing structure affects the scoring including ordering of ideas, transitioning, vocabulary, and varying sentence length. Results show that UH-Hilo students score about the same as the national average (see Table 4). As previously noted, the variance is smaller for the second testing cycles.

Differences between actual and expected senior scores confirm results in Table 4. These values are the lowest of the areas tested, 6.2 (2012) and -2.85 (2013). The value-added scores

also are near zero with 0.12 for 2012 seniors (53rd percentile) and -0.06 for 2013 seniors (46th percentile. These results suggest the College and University need to develop curriculum to teach students how to state a thesis and to develop a compelling supporting argument.

Table 4. Make-an-argument
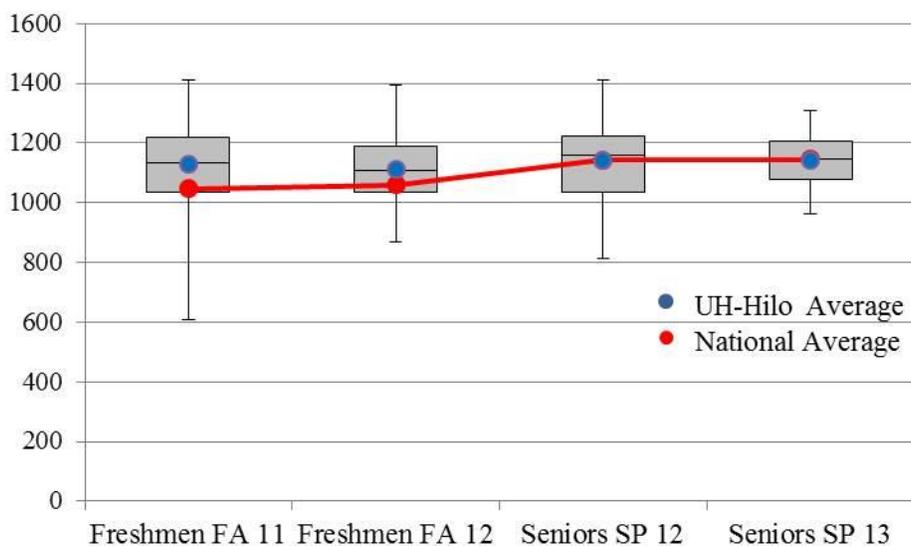
Critique-an-Argument

A Critique-an-Argument prompt asks students to evaluate the reasoning in an argument. Key elements include identifying logic flaws, explaining how the flaws affect the argument's conclusion, and writing a grammatically correct and logically sound critique. Table 5's results show freshmen national averages are somewhat lower than UH-Hilo students and senior averages are about the same.

The differences between actual and expected senior score appear better than shown in Table 5. Point differences between actual and expected scores are 38.5 (2012) and 17.28 (2013). Value added scores are positive, but they are under one, 0.66 for 2012 seniors (78th percentile) and 0.28 for 2013 seniors (64th percentile). These results are better than the Make-an-

Argument scores; however, they suggest the College and University need to develop curriculum to focus on critically analyzing an argument.

Table 5. Critique-an-argument
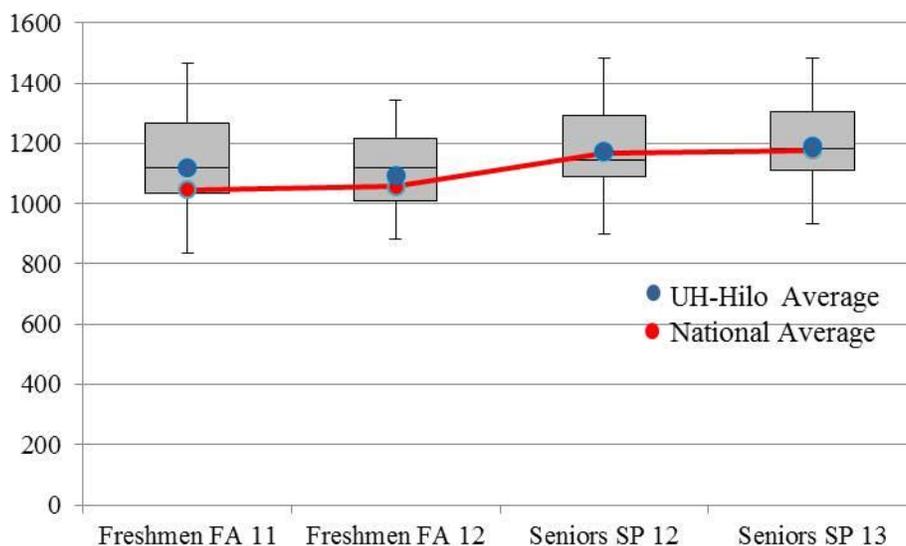
Conclusions

The CLA results provide some evidence of program success and identify areas for improvement. Overall, seniors taking the CLA performed much higher than predicted by college entrance examinations (SAT or ACT). This gap is greater than other universities taking the CLA. Results are not comparative to other universities; however, these findings do infer that the University and College provide significant added educational value to students.

Performance Task results suggest a large and positive gap between actual and expected scores for critical thinking, analytic thinking, and problem solving. This result is encouraging because the College emphasizes these skills in the curriculum. Since fall 2012, a new critical thinking course (BUS 290) is offered as a required business curriculum course. Senior students

taking the spring 2014 likely took the BUS 290 course. Results in Performance Task as well as other CLA test areas should show high added-value provided by the College and University.

Compared to Performance Task, the Analytic Writing results are not as impressive. These findings suggest less added-value provided by the College and University; however, the results suggest some incremental improvement. Even with smaller differences between actual and expected values, the seniors demonstrate an improvement greater than 60 percent (2012) and 50 percent (2013) of schools taking the CLA. Close examination of Analytical Writing helps to identify areas the College can emphasize. Analytical Writing has two subcomponents—Make-an-Argument and Critique-an-Argument.

Test results show that senior's weakest performance is the Make-an-Argument component. Seniors taking the test in 2012 have slightly lower actual scores than their expected scores. On the surface, these findings suggest an area for College and University curriculum development. Students need experience with writing assignments that state a thesis and develop a compelling supporting argument. While this finding may be due to a small sample size, the result provides useful information for further curriculum development.

Interestingly, the Critique-an-Argument results are much higher. The actual scores are higher than expected scores for both years. Senior students appear better able to evaluate the reasoning in an argument than to develop a persuasive argument. The College's curriculum and instruction appears to be doing a better job of getting students to question information presented to them than to develop compelling arguments to promote an idea. Make-an-Argument is essential for managers trying to motivate subordinates to accomplish a task, marketers to make a

sale, financial analysts making recommendations to clients, and accountants presenting results to clients.

These results need to be interpreted with caution for several reasons. First, the samples are small. The University purchased 100 tests for each testing period. The fall 2011 freshmen group was large enough; however, some students did not spend much time writing the test. Efforts to recruit freshmen students in 2012 were disappointing. Less than one-half the previous year's test takers were obtained. The same issue is occurring for collecting freshmen data for fall 2013. To date, only 60 freshmen students have taken the fall 2013 test. Without institutional support, getting cooperative freshmen students is difficult. Students report that their advisors tell them that they do not need to take the test. Offering incentives (e.g., free pizza, extra credit, and a chance to win a free i-Pad) have not been successful. Informing students that University policy requires them to participate has been a bit more successful. Also, the test administration was started before school to assure students did not have schedule conflicts with their classes. This method helped somewhat, but many students did not read their e-mail before the test date.

Second, transfer students bringing 24 credit hours do not report their SAT or ACT scores. About one-third of seniors taking the CLA did not provide the standardized admission test scores because they transferred to UHH with more than 24 credit hours. Sixteen seniors out of 50 (2012) and 12 out of 33 (2013) were not required to send their SAT or ACT scores. One remedy for this problem is to identify students without SAT or ACT scores and order SLE tests as part of their CLA tests. The SLE adds another 30 minutes to the test, but these questions serve as a proxy for the SAT.

Third, the schedule for testing senior students and the offering of the business capstone course do not line-up. The College's small size and number fall students taking the capstone course create challenges for getting test scores for senior students. Potentially, one-half of eligible seniors slip through the net because they take the capstone course at a time when the CLA is not offered for them. Identifying these students is possible, but scheduling convenient testing times is challenging because final-term seniors typically are very busy.

Fourth, the availability of a computer lab to take the CLA is difficult to schedule. The College does not have enough computers in the lab. The best available rooms are in the University Classroom Building (UCB). Unfortunately, these rooms are in high demand for regular classes and their availability for testing is limited. Students can use their own laptop computers. Many seniors may elect to use their own laptop computers, but most freshmen students did not bring laptops to the testing site when given the option.

Finally, the University's retention rate and number of non-business students taking the CLA makes getting a meaningful longitudinal sample problematic. While the CLA does not consider longitudinal data necessary to gain insights on how a school adds value to a student's writing ability, the University's relatively low retention rate and high number of transfer students questions whether or not the transfer students really are similar to the true freshmen. Plausibly, a number of freshmen enter UHH with low SAT or ACT scores, and they do not perform well on their CLA tests. These students affect the expected senior's mean by driving the expected value down. Cleaning the data demonstrates possible evidence of score inflation.