



Office of Research & Effectiveness

CAAP Critical Thinking Test

2009 After Action Report

Introduction

The CAAP Critical Thinking test measures students' ability in clarifying, analyzing, evaluating, and extending arguments. It is one of the direct methods NMC uses to assess student learning on the Critical Thinking general education outcome. In February 2009, 407 students took the CAAP test in 20 courses.

Key Findings

- 50% of NMC students performed better than the national average for two-year institutions
- NMC students consistently perform better than the national average
- Analysis of an arguments is consistently our students' strongest skill
- Students performed similarly on evaluating and extending an argument
- Near-graduates, sophomores, and freshman performed about the same overall

Methodology

The CAAP Critical Thinking test was administered in 20 courses in February 2009 over a two week time period. The courses were selected at random from those that directly support the Critical Thinking general education outcome. The sampling method is a clustered random design. The critical thinking courses are selected at random and then all the students in the course take the test. Sections not included in the population from which the sample was selected included courses delivered on-line, lab sections of lecture courses, AVF courses, internships, late starting seven week courses, developmental courses, and sections that had an enrollment on count day of less than 10 students.

Instructors of the selected sections were notified electronically by the Director of Research & Effectiveness. The final number of students completing the test (407) represents the NMC population of credit students enrolled in critical thinking courses in spring 2009.

The Office of Research & Effectiveness handled the logistic of ordering the tests, scheduling and administering the tests. Once completed all the tests and booklets were returned to ACT for scoring. Within two weeks NMC had its results, and the certificates of achievement were signed by the Vice President for Educational Services and distributed in the classes, with a memo to the instructors explaining the results.

Instrument

The CAAP Critical Thinking test instrument is a series of four passages followed by multiple choice questions (32 questions). The four passages in the test present a series of sub-arguments, overlapping positions, statistical arguments, experimental results, or editorials. Twenty questions measure analysis of the parts of an argument. Six questions each measure evaluation of an argument and extension of an argument, respectively. These three different skills correspond to different capabilities on the NMC critical thinking rubric (Table 1).

The reason this multiple choice type test works in measuring critical thinking is because the students are asked questions specifically about a problem they have read. The questions measure one aspect and one aspect only of critical thinking. The content analysis report - re: the results of the NMC students on each of the critical thinking skill areas - is based on 407 valid scores.

Table 1. Capability	NMC Critical Thinking Rubric	Language in CAAP Technical Handbook
1	Identifies arguments	Analysis of the elements of an argument
2	Demonstrates understanding of different perspectives	Evaluates an argument
3	Uses information	
4	Applies reasoning	
5	Draws conclusions	Extends an argument

Results

With CAAP results we can:

1. Benchmark NMC students’ performance with the nationally normed results
2. Assess performance by content area in the aggregate
3. Compare overall performance by education level (value-added)

We cannot directly measure performance of near-graduates by content area as the results in this format are not available from ACT.

1. Benchmarking

The overall average for the normative group of two year institutions (N= 24,069) was 60.8%. NMC students scored slightly above that with an average 62.3%. About 50% (203) scored above the national average and 55% scored at or above the national average (Table 2). NMC students perform better than the national average consistently. Moreover, their scores have remained consistent longitudinally as we would expect from the cross-sectional nature of the sampling method.

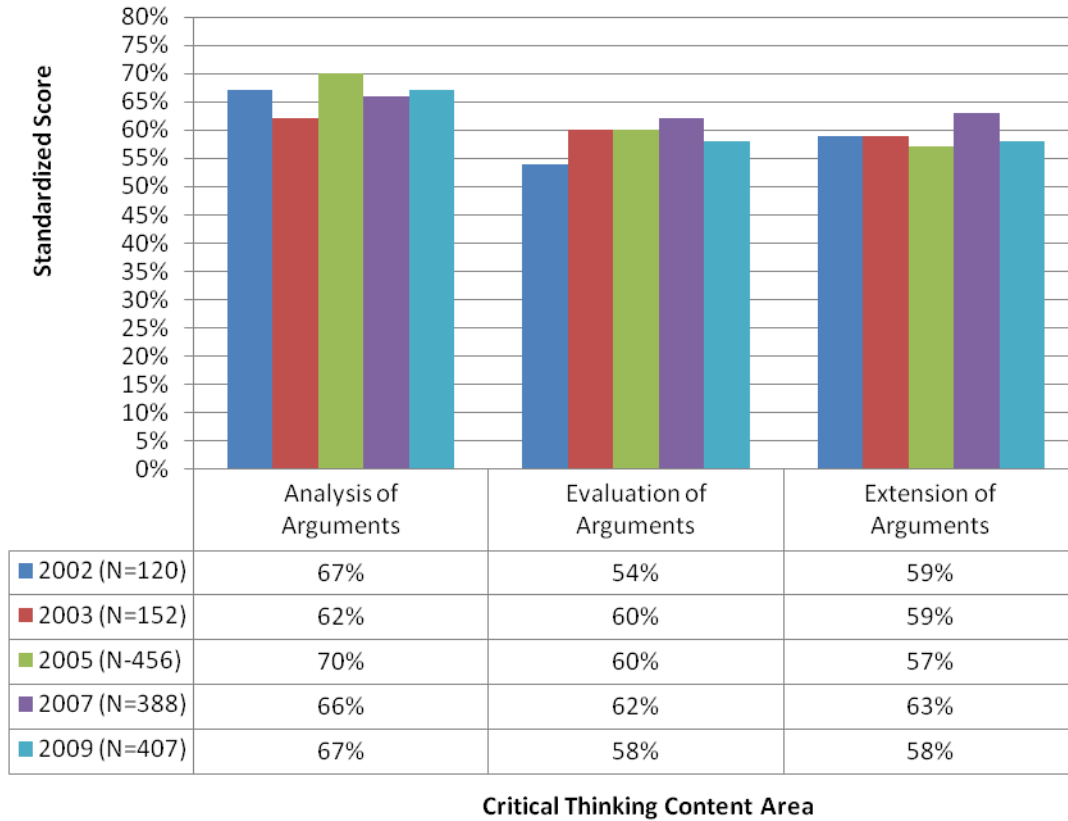
Table 2. National Average Comparison	2002	2003	2005	2007	2009
NMC Average	62%	62%	65%	63%	62%
National Average	61%	61%	61%	61%	61%
NMC N	120	152	456	388	407
Percent Above the National Average	60%	60%	67%	60%	50%
Percent At or Above the National Average	N/A	70%	75%	65%	55%
Source: CAAP Critical Thinking Test Results					

2. Content Analysis

Extra item content analysis determines the specific areas in which NMC students can improve their critical thinking skills. Table 3 indicates that overall students’ strongest skill is in the analysis of arguments, while the weakest skill has seesawed between the evaluation of arguments and the extension of arguments. This finding is consistent with the results from the artifact assessment.

In a comparison with the national normative group, NMC students outperformed the average in all three content areas in 2009 (Table 4). Table 4 shows the percentage difference in the standardized scores between NMC students and the normative group scores on the three content areas and overall. It also shows the percent differences broken down by three group sectors (bottom 25th percentile, middle 50th, and top 25th). Positive differences indicate that NMC students performed better than the normative group. Differences less than 5% are considered negligible, between 5-10% are moderate, and greater than 10% are substantial.

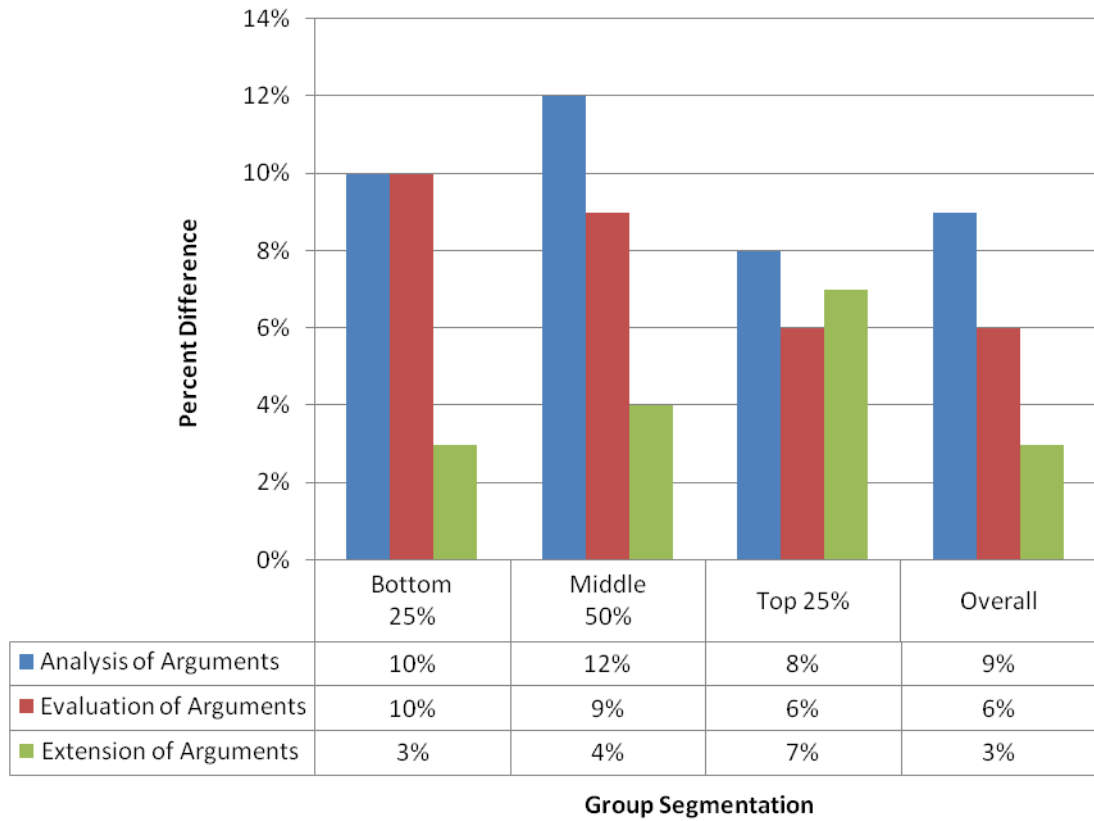
Table 3. CAAP Critical Thinking Test Content Analysis



NMC students in the bottom 25th percentile performed substantially better on analysis of arguments and evaluation of arguments than the corresponding sector of the normative group by 10%. NMC students in the 50th percentile substantially outperformed the corresponding normative group in the analysis of arguments (by 12%) and did moderately better in evaluating arguments (by 9%). Finally, NMC students that performed in the top 25th percentile scored moderately better than the corresponding normative group in all of the critical thinking skills (between 6-8% difference). In neither the content areas nor group percentiles, did NMC students exhibit having more difficulty than the corresponding normative group.

The national trends indicate that the evaluation of arguments – considering different perspectives and using information in resolving problems – is a weak area among all other two-year institutions across the nation on average.

**Table 4. Content Analysis Comparison:
Percent Difference between NMC and National Averages**



3. Exposure to NMC Curriculum

In the past, students were divided into three groups to test the effect of increasing exposure to NMC’s curriculum on their CAAP Critical Thinking scores. In 2009, near-graduates (more than 45 credit hours) scored a 63%, sophomores a 63%, and freshmen a 62% (Table 5). As for the previous CAAP administration in 2007, the differences among these scores are negligible.

Table 5. CAAP Performance by Educational Level	2007¹	2009²
Freshman (0-30 credit hours)	62%	62%
Sophomore (31-45 credit hours)	63%	63%
Above Sophomore (above 45 credit hours)	64%	63%
Note: ^{1,2} not significantly different		
Source: <u>CAAP Critical Thinking Test Results</u>		

What This Tells Us

In prior years, we could not be certain from the evidence that increasing NMC experience facilitated the learning of critical thinking skills; and we still find ourselves in that situation. There is little difference in the scores among freshmen (62%), sophomores (63%), and near graduates (63%). With the content analysis, we are able to demonstrate that NMC students performed better than the national average in the three content areas. Unfortunately, with the lack of raw data we are unable to directly measure the different critical thinking content areas of our near-

graduates. Because the sample of students includes those with varying degrees of college coursework, we would not necessarily expect to see improvement from year to year on the overall score. The CAAP Critical Thinking test is still a useful tool in providing a national benchmark for critical thinking skills. It is useful in demonstrating the capabilities that NMC students need to develop, overall. It is no longer useful in pointing us in a direction to improve the skills of our near graduates specifically.

If you have questions or comments about this report and the analyses please contact the Office of Research & Effectiveness, 995-1084 or dhiller@nmc.edu.