Office of Institutional Research

To: Scholarship Action Group and Curriculum Committee
CC: Stephen Siciliano
From: Darby Hiller
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Subject: CAAP After Action Report – Spring 2007

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 2007, selected faculty and members of the Scholarship Action Group administered the CAAP Critical Thinking test in 21 courses to 416 students.

Key Findings

- 60% of NMC students performed better than the national average for two-year institutions
- NMC students have performed better than the national average since we started using CAAP to measure the critical thinking general education outcome
- Out of the three critical thinking content areas - analysis, evaluation, and extension - evaluation of arguments is consistently our students' weakest skill
- While evaluating arguments is our weak area, NMC students still substantially outperformed the national normative group in this area by 11%
- Juniors, sophomores, and freshman performed about the same overall

Methodology and Instrument

The CAAP Critical Thinking test was administered in 21 courses in February 2007 over a two week time period. The courses were selected at random from those that directly support the Critical Thinking general education outcome. Overall there were 139 courses with 348 sections offered in spring 2007. Those included FLO, internships, late starting seven week courses, developmental courses and labs. Since, the CAAP Critical Thinking test is a paper based, face to face administration, the FLO, late starting courses, developmental courses, labs and internships were removed from the possible population

from which the sample was selected. That left 235 possible sections. Of those, 18 primary courses (with 400 enrollees) and 3 secondary courses were randomly selected. Instructors were notified electronically by the Vice President for Educational Services. The number of courses selected was dependent on the number of students enrolled. A sample of 416 students roughly represents the NMC population of credit students in spring 2007.

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 and distributed in the classes.

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).

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	Extends an argument
5	Draws conclusions	

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 388 valid scores.

Results

The results are presented as standardized scores. The overall average for the normative group of two year institutions (N= 21,114) was 60.5%. NMC students scored slightly above that with an average 62.6%. About 60% (250) scored above the national average and 65% 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.

Table 2. National Average Comparison

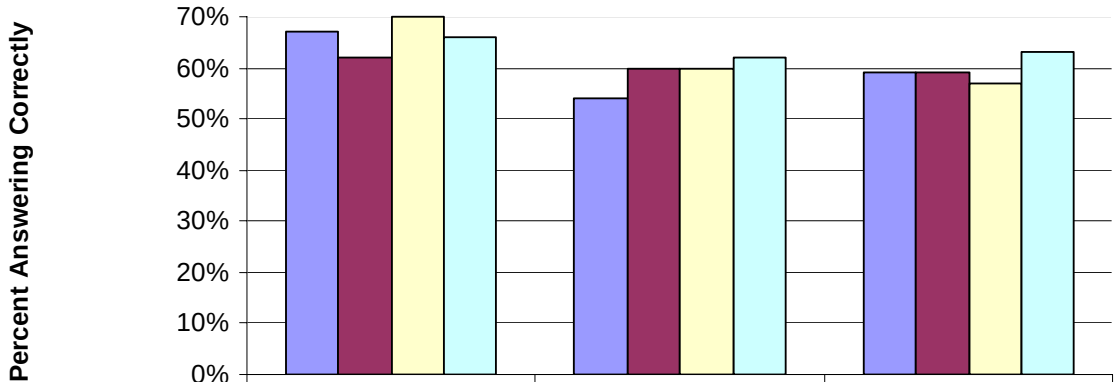
Year Critical Thinking Test Administered	**2002**	**2003**	**2005**	**2007**
National Average	61%	61%	61%	61%
NMC Average	62%	62%	65%	63%
NMC N	120	152	456	416
Percent Above the National Average	60%	60%	67%	60%
Percent At or Above the National Average	N/A	70%	75%	65%

Content Analysis

Extra item content analysis determines the specific areas in which NMC students can improve their critical thinking skills. Over the past five years, evaluation of an argument – considering different perspectives and using information to help solve a problem – has remained the weakest critical thinking capability of NMC students. The 2007 CAAP results further confirm this trend (Table 3). Out of the three content areas, evaluation of arguments is the weakest skill. However, NMC students have improved in this area over time. NMC students have also improved over time in extending arguments – using reasoning and drawing conclusions.

In a comparison with the national normative group, NMC students outperformed the average in all three content areas in 2007. Table 4 shows the difference in the percent correct 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 25% percentile, middle 50%, and top 25%). 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 Skills



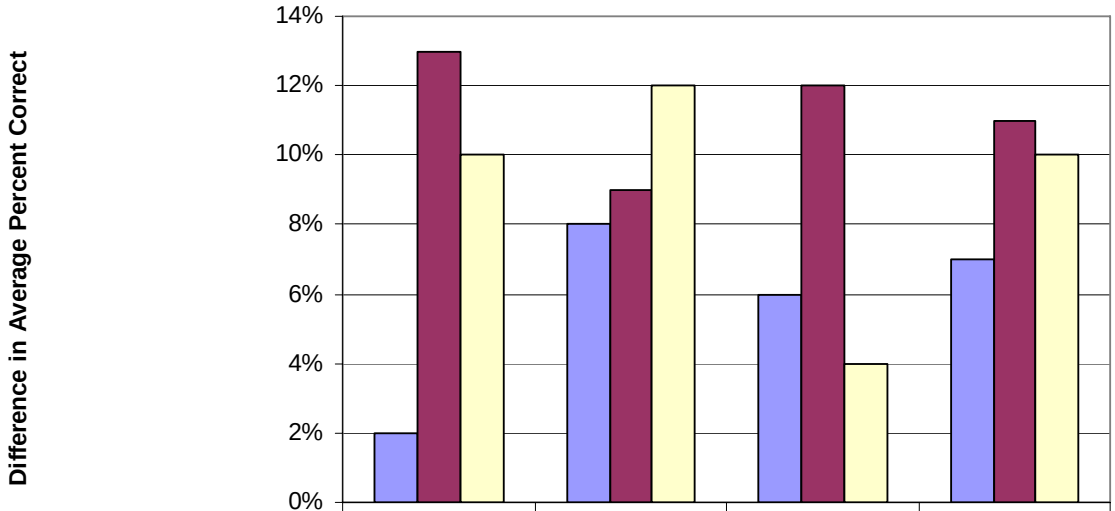
	Analysis of Arguments	Evaluation of Arguments	Extension of Arguments
2002 (N=120)	67%	54%	59%
2003 (N=152)	62%	60%	59%
2005 (N=456)	70%	60%	57%
2007 (N=388)	66%	62%	63%

Content Skill

NMC students that performed in the bottom 25th percentile overall, performed substantially better on the evaluation of arguments than the corresponding sector of the normative group by 13%. NMC students that performed at the 50th percentile overall, substantially outperformed the corresponding normative group in the extension of arguments by 12%. Finally, NMC students that performed in the top 25th percentile overall, substantially outperformed the corresponding normative group in evaluating arguments by 12%. In neither the content areas nor group percentiles, did NMC students exhibit having more difficulty than the corresponding normative group.

So, while the weakest area for NMC students was in the evaluation of arguments, NMC students performed substantially better in that area than the national normative group by 11%. This indicates 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



	Bottom 25%	Middle 50%	Top 25%	Overall
Analysis of Arguments	2%	8%	6%	7%
Evaluation of Arguments	13%	9%	12%	11%
Extension of Arguments	10%	12%	4%	10%

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. Overall, students with greater exposure to the NMC curriculum as defined by a greater number of credit hours, performed better than those with fewer credit hours. In 2007, near-graduates (52 or more credit hours), scored a 64%, sophomores a 63%, and freshmen a 62%, but these differences are negligible. In previous years, we were able to analyze performance differences among classes in the different content areas due to the availability of data. However, ACT was not willing to share the item level data by individual this year. Perhaps in the future ACT will be able to provide the content analysis by educational level, which will help NMC to directly measure near-graduates' skills.

What This Tells Us

NMC students over time have improved in their ability to evaluate arguments, although evaluating arguments continues to be the weakest skill tested. 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 juniors (64%). 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 and where NMC students compare. 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. While the Scholarship Action Group continues to support the use of the CAAP Critical Thinking test, it will explore other assessment methods as well.

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