

ACT CAAP Critical Thinking Test Results 2007 – 2008

Executive Summary

The ACT Collegiate Assessment of Academic Proficiency (CAAP) Critical Thinking Test was administered in fall 2007 to 200 seniors and 178 freshmen. A locally-developed questionnaire also was administered to gauge students' opinions about the critical thinking domain of the general degree requirements. Key findings include the following:

- Seniors ($M=64.2$) at UWSP scored significantly higher on the Critical Thinking Test than freshmen ($M=61.4$).
- Both freshmen and seniors place a high degree of importance on the need to develop critical thinking skills, with 92% of each group saying it is “somewhat important” or “absolutely essential” to develop critical thinking skills to meet their educational and career goals.
- Seniors were mixed in their opinions about the impact of the GDR courses on their critical thinking skills, suggesting some ambiguity in the degree to which seniors understand the critical thinking dimension of the GDR curriculum.

Background

The ACT Collegiate Assessment of Academic Proficiency (CAAP) Critical Thinking Test was administered in fall 2007. The test served two purposes: (1) to contribute to the assessment of the critical thinking domain of the general degree requirements at UWSP and (2) to fulfill UWSP's participation in the “College Outcomes Research Project” of public universities being conducted by ACT. In addition to the Critical Thinking Test, students were asked to respond to a questionnaire of nine locally-developed questions. UWSP previously administered the CAAP Critical Thinking Test in 2001 and 2004, although sample sizes were smaller and the focus was to compare UWSP students to a national sample. The current administration was focused on a cross-sectional rather than normative approach, which subsequently will be discussed.

According to ACT, the Critical Thinking test measures skills in analyzing, evaluating, and extending arguments. An argument is defined as a sequence of statements that includes a claim that one of the statements, the conclusion, follows from the other statements. Each passage in the test presents a series of subarguments in support of a more general conclusion or conclusions. A variety of formats is used: case studies, debates, dialogues, overlapping positions, statistical arguments, experimental results, or editorials. The test consists of 32 items and it is administered in 40 minutes.

Methods and Participants

In fall 2007, faculty were contacted to explore the feasibility of administering the CAAP Critical Thinking Test during a regular class meeting time. Courses that enroll high percentages of seniors and freshmen were targeted for the invitation; the test was administered in 13 upper-level course sections and six lower-level/introductory course sections. Students were given the option of not participating although some instructors offered incentives (i.e., extra credit or research participation)

for participants. Students also were told that they would be eligible to receive their individual score report as a result of participation.

Participants included 200 seniors, 178 freshmen, and a small number of sophomores and juniors. For the purposes of this cross-sectional analysis, only seniors and freshmen were used. A profile of participants can be found in Table 1 below. Compared to the student body at large, the following observations can be made:

- Females are overrepresented among the freshmen and underrepresented among the seniors.
- Part-time students are underrepresented among freshmen and seniors.
- Among the freshmen sample, the College of Natural Resources (CNR) is vastly underrepresented and the College of Professional Studies (CPS) overrepresented.
- Among the senior sample, CNR is overrepresented to a great extent, whereas Letters and Science (L&S) is underrepresented to a great extent and Fine Arts and Communication (FAC) to a lesser extent.

Table 1. Profile of Participants

	Freshmen (N = 178)	Senior (N = 200)
Sex		
Female	64.6%	39.5%
Male	35.4%	60.5%
Race/Ethnicity		
Students of Color	10.1%	2.5%
White	87.6%	92.5%
Unknown	2.2%	5.0%
Cumulative GPA (self-reported)		
Below 2.0	0%	1%
2.00 – 2.50	2.3%	7.6%
2.51 – 3.0	15.9%	31.3%
3.01 – 3.50	43.2%	39.4%
3.51+	38.6%	20.7%
Full/Part-Time Status		
Part-time	1.1%	4.5%
Full-time	98.9%	94.5%
Enrolled as Freshman		
Yes	97.2%	62.5%
No	2.8%	36.5%
College from Reported Major		
Fine Arts and Communication	9.6%	18.1%
UWSP percentage in FAC	(9.7%)	(12.9%)
Letters and Science	58.2%	27.6%
UWSP percentage in L&S	(58.3%)	(51.7%)
Natural Resources	1.1%	34.7%
UWSP percentage in NR	(13.4%)	(14.7%)
Professional Studies	31.1%	19.6%
UWSP percentage in PS	(18.6%)	(20.6%)

Test Results

Standard scores on the Critical Thinking Test can range from 40 to 80. The scores among UWSP seniors ranged from 51 to 73 and from 49 to 72 for freshmen. An independent-samples t-test was conducted, and seniors scored significantly higher than freshmen [$M=64.2$, $SD=4.8$; $t(376)=-5.92$, $p=.000$]. See Table 2.

Table 2. Critical Thinking Test Scores

	Freshmen (N = 178)	Senior (N = 200)	National^a (N = 12,073)
Mean Standard Score	61.4	64.2**	62.6
SD	4.4	4.8	5.4

^a Based on data from sophomores at four-year institutions who took the CAAP in the past three-years.

** Statistically significant at $p<.01$.

At the conclusion of the test, students are asked to indicate the level of effort they expended on the test. As can be seen in Table 3, 93% of UWSP students tried their best or gave moderate effort; only 2% indicated that they gave no effort.

Table 3. Reported Motivation and Accompanying Scores

	Freshmen (N = 178)		Senior (N = 200)		TOTAL	
	Percent ^a	CT Score	Percent ^a	CT Score	Percent ^a	CT Score
Tried their best	46%	62.0	47%	65.4	47%	63.8
Gave moderate effort	47%	61.5	45%	64.6	46%	63.1
Gave little effort	6%	60.4	5%	60.7	6%	60.6
Gave no effort	1%	55.5	3%	56.7	2%	56.4

^a Based on those responding to the question.

On the whole, students had significantly higher test scores [$F(3,353)=9.0$, $p=.000$] based on the level of effort expended (i.e., the more effort expended, the higher the score). The level of effort was more influential among seniors where a one-way between-groups ANOVA revealed statistically significant scores [$F(3,182)=10.4$, $p=.000$] between students who tried their best ($M=65.4$, $SD=4.46$) and those who gave little effort ($M=60.7$, $SD=4.06$) or no effort ($M=56.7$, $SD=4.46$). Senior students who gave moderate effort ($M=64.6$, $SD=4.27$) also had significantly higher scores than those who gave no effort. The effect size, calculated with eta squared, was .15, which is considered high. The scores of freshmen by level of effort expended were not statistically different from one another [$F(3,167)=1.80$, $p=.15$]. Although the number of students in the “little effort” and “no effort” groups is relatively small, encouraging students to give their best effort is a reasonable strategy under any circumstance.

Students were asked to report their major of study from which College could be ascertained. Because of insufficient representation of the four colleges, meaningful comparisons could not be made within the sample of freshmen. However, a one-way ANOVA was conducted with the senior sample to compare mean scores based on college. The scores between senior students enrolled in the four colleges were not significantly different from one another [$F(3,195)=1.61$, $p=.188$].

Finally, comparisons were made between scores on the Critical Thinking Test and common individual input variables – such as ACT, high school rank, and high school grade point average – as maintained in the institution’s database. ACT scores were available for 293 of the students in the sample and there was a strong positive correlation between ACT score and score on the critical thinking test [$r=.61, n=293, p<.001$]. Neither high school rank nor high school grade point average had a relationship to scores on the critical thinking test.

Questionnaire Results

At the conclusion of the timed test, students were asked to complete a brief questionnaire consisting of nine questions that were developed by the Assessment Subcommittee (see attached). The questionnaire was designed to gauge students’ opinions and perceptions about the critical thinking component of the general degree requirements (GDR).

When asked if they were aware that critical thinking is an objective of the GDR curriculum, over half of freshmen (53%) said “yes” compared to 34% of seniors. Both groups, however, placed a high degree of importance on the need to develop critical thinking skills. Ninety-two percent of freshmen and 92% of seniors said it is “somewhat important” or “absolutely essential” to develop critical thinking skills to meet their educational and career goals. Both groups also gave higher ratings to their own proficiency using critical thinking skills than to their peer groups. On a scale of 0 to 9, where 9 is extremely proficient, seniors rated their proficiency as 6.44 whereas freshmen rated theirs slightly lower at 6.02. Their ratings of peers’ critical thinking abilities were the same at 5.5.

Freshmen were generally more positive in their opinions about the critical thinking component of the GDR curriculum than were seniors; however, given that 86% of the freshmen in this sample were new to UWSP, their exposure to the GDRs would be more limited. Results from seniors only are presented hereafter. Seniors were mixed in their opinions about the impact of the GDR courses on their critical thinking skills. Thirty-seven percent of them agreed or strongly agreed that the GDR courses have improved their critical thinking skills and the same percentage (37%) disagreed or strongly disagreed with that sentiment. The remaining 27% were undecided about the impact of GDR courses on their critical thinking skills. In terms of the extent to which GDR courses address critical thinking, 36% of seniors indicated that courses address critical thinking skills somewhat to a great deal whereas 43% said a little bit and 8% said not at all. Only 13% of seniors were neutral on this point.

These results suggest some ambiguity in the degree to which seniors understand the critical thinking dimension of the GDR curriculum. One possibility is that they have been immersed in courses to fulfill the degree requirements of their majors and not as engaged in GDR courses and, thus, they are less able to rate the GDR experience. A second possibility is the ambiguous nature of the critical thinking construct itself and whether students are able to hone in on the specific skill or whether they might simply be expressing discontent with GDRs collectively. Regardless, students view critical thinking skills as vital to their educational and career goals and recognize its value.

Summary and Recommendations

Results of the fall 2007 administration of the CAAP Critical Thinking Test demonstrated that seniors at UWSP scored significantly higher than freshmen. One limitation in the method of

administration was that freshmen and seniors were both tested in fall semester whereas a stronger cross-sectional approach might test freshmen in the fall of their first semester and seniors in the spring of their final semester. Although most freshmen were, in fact, new freshmen (85%), the seniors were not limited to those who were in their last term or graduating within the academic year. Both of these would be sensible considerations should the CAAP Critical Thinking Test be administered again at UWSP.

However, before re-administering the CAAP Critical Thinking Test, further examination would help determine its appropriateness as a measure of critical thinking skills developed by students as a result of their educational experiences at UWSP. Several questions were posed in the recommendations section of the 2004 UWSP report of the CAAP Critical Thinking Test. These questions remain prudent in 2008 and should be explored:

- Is the test a valid measure of the critical thinking skills students are expected to develop at UWSP?
- How important is it for UWSP students to develop critical thinking skills as operationalized by the ACT CAAP Critical Thinking Test?
- What should be the expected level of performance on the Critical Thinking Test for UWSP seniors?
- Should more instruction be devoted to increasing students' critical thinking skills in GDR critical thinking courses?
- Should more critical thinking instruction be infused into the curriculum in general?

In the context of UWSP's revision of the general education program and the increased emphasis on assessment, additional questions might include:

- What is the best methodological approach for UWSP – cross-sectional, longitudinal, etc.?
- How can the process of administration be structured so as to produce valid, credible, and actionable results? (e.g., ensuring robust, representative samples by having access to students/courses, etc.)
- How can the results be used for continuous improvement efforts? How can the institution, colleges, and departments increase the utility of assessment of critical thinking skills?
- How can measurement of critical thinking contribute to student learning outcomes assessment for the institution?
- Can standardized measurement be used to fulfill other institutional requirements, such as for participation in the Voluntary System of Accountability (VSA)?

Prepared by:
Shari Ellertson
Policy and Planning, Office of the Chancellor
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