

2014-2015 Critical Thinking Assessment Report: Results Summary

Executive Summary

One hundred and fifty-seven student papers were scored by two separate raters using the AAC&U Critical Thinking VALUE Rubric. Four traits (Explanation of Issue; Selecting and Using Evidence; Student's Position, Perspective, and Hypothesis; and Conclusion and Related Outcomes) were scored on a five-point scale with 0=Not Meeting Benchmark, 1=Meeting Benchmark, 2=Milestone A, 3=Milestone B, and 4=Capstone. Analyzed scores are averages of individual raters' scores.

Approximately 19% of the critical thinking assessments achieved an average Overall Total Score at the Milestone B or Capstone performance levels. Almost 32% of the student papers achieved average scores at the Milestone B or Capstone levels for the Explanation of Issue trait, 25% for Selecting and Using Evidence, 20% for the Student's Position, Perspective, and Hypothesis trait and 16% for the Conclusion and Related Outcomes trait on the AAC&U Critical Thinking VALUE Rubric. Washburn students performed best on the Explanation of Issue and Selecting and Using Evidence critical thinking traits, and performed lowest on the Student's Position, Perspective, and Hypothesis trait and the Conclusion and Related Outcomes trait.

The orientation training for the raters was fairly effective with 66% of the raters' scores differing less than one point. Students scoring at the Capstone or Milestone B levels varied from a high of 31.8% (Explanation of Issue) to a low of 15.9% (Conclusion and Related Outcomes) with Selecting Evidence (24.8%) and Student's Position/Perspective/Hypothesis (20.3%) falling between. However, those students scored as not meeting benchmark performance level ranged from 1.9% (Explanation of Issue) to 6.4% (Student's Position/Perspective/Hypothesis). There appears to be significant work that needs to be accomplished in assisting students with attaining the benchmark level of critical thinking.

Key Findings for 2014-2015 Rater Differences

- 14% of the Overall Total Scores from the two raters did not differ, 52% differed less than 1 point, and 12% differed by 1 full point
- 78% of the student papers did not have scores that differed enough to require a 3rd rater, but 22% had a difference of greater than 1 point and an additional rater was necessary
- Raters were most consistent in scoring the Selecting and Using Evidence trait, followed by the Explanation of Issue and the Conclusion and Related Outcomes critical thinking traits
- The Student's Position, Perspective, and Hypothesis trait was least consistent among raters with 19% of the trait ratings differing by 2-3 points

Key Findings for 2014-2015 Performance

- 19% achieved an average Overall Total Score at the Milestone B or Capstone performance levels (1% at Capstone, 18% at Milestone B, 52% at Milestone A, 25% at Meeting Benchmark, and 5% at the Not Meeting Benchmark performance level)
- 32% of student papers attained average scores at the Milestone B or Capstone levels for the Explanation of Issue trait, 25% for Selecting and Using Evidence, 20% for the Student's Position, Perspective, and Hypothesis trait, and 16% for the Conclusion and Related Outcomes trait
- Averaged Overall Total Scores ranged from 0.50 to 4.00 with a mean of 2.24, a median of 2.25, a mode of 2.50, and a standard deviation 0.733
- The Explanation of Issue trait had the highest mean averaged score at 2.45, followed by Selecting and Using Evidence at 2.31, and Student's Position, Perspective, and Hypothesis at 2.11; and the Conclusion and Related Outcomes trait had the lowest mean averaged score at 2.08

2014-2015 Critical Thinking Assessment Report: Results Summary

Introduction: A total of 157 senior student papers were scored by two separate raters using AAC&U Critical Thinking VALUE Rubric. Four traits (Explanation of Issue; Selecting and Using Evidence; Student’s Position, Perspective, and Hypothesis; and Conclusion and Related Outcomes) were scored on a five-point scale with 0= Not Meeting Benchmark, 1=Meeting Benchmark, 2=Milestone A, 3=Milestone B, and 4=Capstone. When there were only two raters (their overall mean scores did not differ by more than 1.0) the mean for each trait and the overall total is the average of the two rater’s scores. If the two raters differed by more than 1.0 for the overall total scores, then a third rater also scored the paper. In cases of three raters, the mean for each trait and the overall total is the average of the three raters’ scores.

Differences between Individual Raters: Approximately 14% of the Overall Total Scores from the two raters did not differ, 52% differed less than 1 point, and almost 12% differed by 1 full point. Therefore, 78% of the student papers did not have scores that differed enough to require a 3rd rater, but 22% had a difference of greater than 1 point (see Table 1) and an additional rater was necessary.

Table 1. Frequencies and Percentages of Overall Average Score Differences between Raters

Average Score Difference	Frequency	Percent	Cumulative Percent
0.00	22	14.0%	14.0%
0.25	26	16.6%	30.6%
0.50	33	21.0%	51.6%
0.75	23	14.6%	66.2%
1.00	18	11.5%	77.7%
1.25	14	8.9%	86.6%
1.50	10	6.4%	93.0%
1.75	5	3.2%	96.2%
2.00	1	0.6%	96.8%
2.25	2	1.3%	98.1%
2.50	2	1.3%	99.4%
2.75	1	0.6%	100.0%
Total	157	100.0%	22.3%

Table 2. Descriptive Statistics for Rater Score Differences

Critical Thinking Trait	Mean	Std. Dev.	Minimum	Maximum
Explanation of Issue	0.854	0.791	0.00	3.00
Selecting and Using Evidence	0.682	0.670	0.00	2.00
Student’s Position, Perspective & Hypothesis	0.905	0.758	0.00	3.00
Conclusion and Related Outcomes	0.905	0.732	0.00	4.00
Average Score Overall	0.725	0.579	0.00	2.75

The mean difference between raters for the Overall Total Scores was 0.725 with a standard deviation of 0.579, and these differences ranged from 0 to 2.75 (see Table 2). The differences between raters for the critical thinking traits ranged from 0 to 2 points for Selecting and Using Evidence, ranged from 0 to 3 points for the Explanation of Issues and the Student’s Position, Perspective, and Hypothesis traits, and ranged from 0 to 4 points for the Conclusion and Related Outcomes trait. The mean rater differences for the Student’s Position, Perspective, and Hypothesis trait and the Conclusion and Related Outcomes trait had the highest mean difference at 0.905, followed by the Explanation of Issues trait at 0.854, and the trait with the smallest mean difference between raters was Selecting and Using Evidence at 0.682.

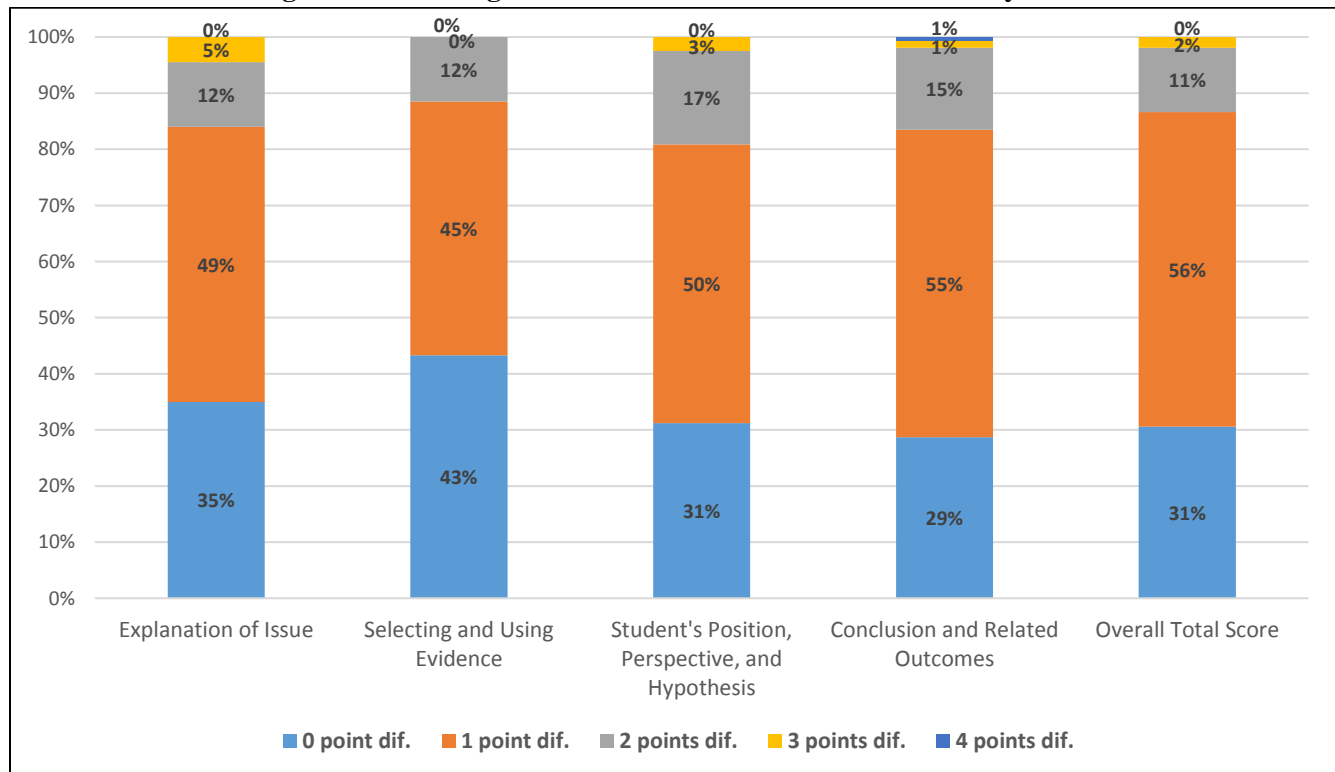
Frequencies and percentages of the difference scores for each trait on the AAC&U Critical Thinking VALUE Rubric were computed; and the 0- and 1-point score differences, as well as the 2-, 3-, and 4-point score differences, were combined to provide frequencies and percentages for the closer and more widely disparate scores by trait (see Table 3). Raters seemed to be most consistent for the Selecting and Using Evidence scores with 89% of the ratings for that trait differing by 0-1 points. Raters were fairly consistent for the Explanation of Issue and Conclusion and Related Outcomes traits, with 84% and 83% of the ratings having score differences equal to 0 or 1, respectively. The Student's Position, Perspective, and Hypothesis trait seemed to be the critical thinking trait for which raters were least consistent with 81% of the ratings differing by 0 or 1, and 19% of the trait ratings differing by 2-3 points.

Table 3. Frequencies and Percentages of Rater Score Differences by Trait

Rater Score Differences	Explanation of Issue		Selecting and Using Evidence		Student's Position, Perspective & Hypothesis		Conclusion & Related Outcomes		Overall Total Score	
	Freq.	Perc.	Freq.	Perc.	Freq.	Perc.	Freq.	Perc.	Freq.	Perc.
0	55	35.0%	68	43.3%	49	31.2%	45	28.7%	48	30.6%
1	77	49.0%	71	45.2%	78	49.7%	86	54.8%	88	56.1%
0 or 1	132	84.1%	139	88.5%	127	80.9%	131	83.4%	136	86.6%
2	18	11.5%	18	11.5%	26	16.6%	23	14.6%	18	11.5%
3	7	4.5%	NA	NA	4	2.5%	2	1.3%	3	1.9%
4	NA	NA	NA	NA	NA	NA	1	0.6%	NA	NA
2, 3, or 4	25	15.9%	18	11.5%	30	19.1%	26	16.6%	21	13.4%

Figure 1 visually presents the percentages of ratings for each trait on the AAC&U Critical Thinking VALUE Rubric by the point differences between rater scores.

Figure 1. Percentages of Point Differences between Raters by Trait



Descriptive Statistics for Averaged Overall Total Scores and Trait Scores: The overall total scores for the 157 Critical Thinking papers ranged from 0.50 to 4.00 with a mean or “average score” of 2.24, a median or “middle score” of 2.25, and a mode or “most frequent score” of 2.50 (see Table 4). The consistency of the mean and median, accompanied by the standard deviation, or “average score distance” from the mean, of 0.733 indicate that the overall total average scores cluster around the mean.

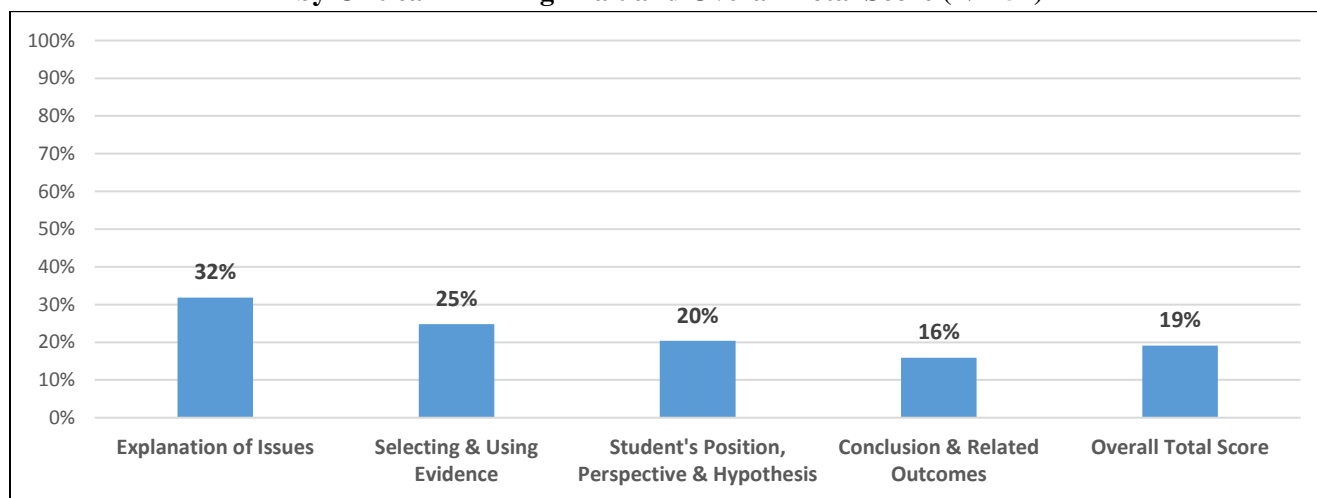
The AAC&U Critical Thinking Rubric trait with the highest mean average score was Explanation of Issue at 2.45 followed by Selecting and Using Evidence at 2.33, and with the smallest standard deviations among the traits assessed at 0.792 and 0.783, respectively (see Table 4). The Student’s Position, Perspective, and Hypothesis trait rendered a mean of 2.11 with the highest standard deviation among the traits at 0.851. The Conclusion and Related Outcomes trait showed the lowest mean of the Critical Thinking traits assessed at 2.08 with a standard deviation of 0.809.

Table 4. Descriptive Statistics for Critical Thinking Assessment Average Scores (N=157)

Critical Thinking Trait	Mean	Median	Mode	Std. Dev.	Minimum	Maximum
Explanation of Issue	2.45	2.50	2.00	0.792	.50	4.00
Selecting & Using Evidence	2.31	2.33	2.00	0.783	0.00	4.00
Student’s Position, Perspective & Hypothesis	2.11	2.00	2.00	0.851	0.00	4.00
Conclusion & Related Outcomes	2.08	2.00	2.00	0.809	.50	4.00
Overall Total Score	2.24	2.25	2.50	0.733	.50	4.00

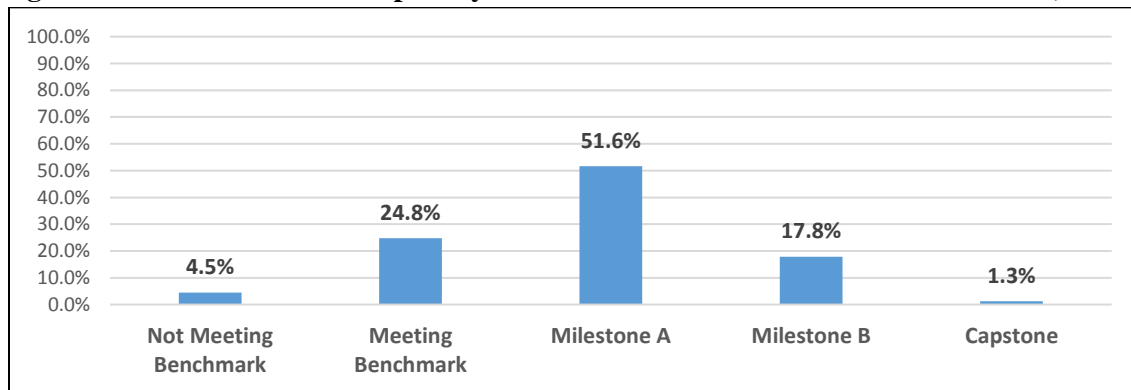
Percent Scoring at Milestone B/Capstone Performance Levels for Overall Total and Trait Scores: Of the 157 student papers, 19% achieved an overall total average score at the Milestone B (score=3) or Capstone (score=4) performance levels (see Figure 2). Almost 32% of the student papers attained average scores at the Milestone B or Capstone levels for the Explanation of Issue critical thinking trait, 25% for Selecting and Using Evidence. Approximately 20% achieved scores of 3 or 4 (the Milestone B or Capstone performance levels) for the Student’s Position, Perspective, and Hypothesis trait and 16% of the student papers reached the Milestone B or Capstone performance levels with scores of 3 or 4 for the Conclusion and Related Outcomes trait for the AAC&U Critical Thinking Rubric.

Figure 2. Percent of Students with Scores of 3 (Milestone B) or 4 (Capstone) by Critical Thinking Trait and Overall Total Score (N=157)



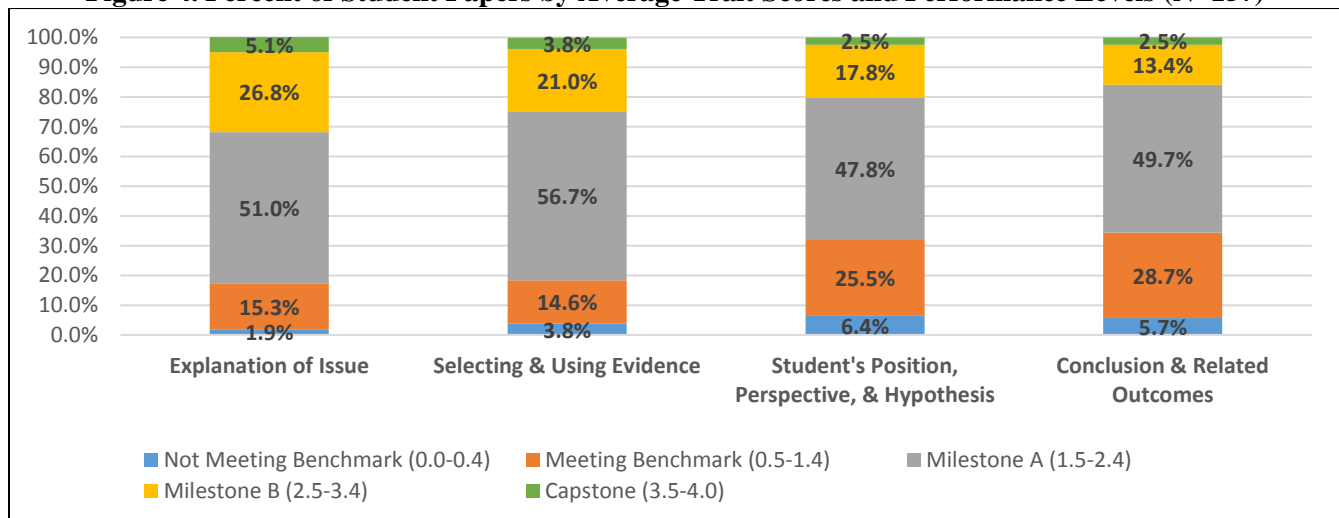
Percent Scoring at Each Performance Level for Average Overall Total Scores: After averaging the 2 or 3 rater scores for the overall total and rounding those scores to whole numbers that correspond to the AAC&U Critical Thinking Rubric performance levels, 1% of the 157 student papers attained a rounded average overall total score at the Capstone performance level (see Figure 3). Almost 18% of the student papers achieved average overall total scores at the Milestone B level, 52% at Milestone A, 25% at Meeting Benchmark, and almost 5% of the average overall total scores for the Critical Thinking Assessment scored at the Not Meeting Benchmark performance level.

Figure 3. Percent of Student Papers by Overall Total Score and Performance Level (N=157)



Percent Scoring at Each Performance Level for Average Critical Thinking Trait Scores: Approximately 5% of the critical thinking assessments achieved an average Explanation of the Issue trait score at the Capstone performance level, 27% scored at the Milestone B level, 51% at the Milestone A level, 15% at the Meeting Benchmark level, and 2% scored at the Not Meeting Benchmark performance level (see Figure 4). For the Explanation of Issue trait 32% of student papers assessed achieved the Milestone B or Capstone performance levels. Almost 4% attained an average Selecting and Using Evidence trait score at the Capstone performance level, 21% scored at the Milestone B level, 57% at the Milestone A level, 15% at the Meeting Benchmark level, and 4% scored at the Not Meeting Benchmark performance level. For the Selecting and Using Evidence trait 25% of student papers assessed achieved the Milestone B or Capstone performance levels.

Figure 4. Percent of Student Papers by Average Trait Scores and Performance Levels (N=157)



Almost 3% of the critical thinking assessments achieved an average Student's Position, Perspective, and Hypothesis trait score at the Capstone performance level, 18% scored at the Milestone B level, 48% at the Milestone A level, 26% at the Meeting Benchmark level, and 6% scored at the Not Meeting Benchmark performance level (see Figure 4). For the Student's Position, Perspective, and Hypothesis trait 20% of student papers assessed achieved the Milestone B or Capstone performance levels. Approximately 3% attained an average Conclusion and Related Outcomes trait score at the Capstone performance level, 13% scored at the Milestone B level, 50% at the Milestone A level, 29% at the Meeting Benchmark level, and 6% scored at the Not Meeting Benchmark performance level. For the Conclusion and Related Outcomes trait 16% of student papers assessed achieved the Milestone B or Capstone performance levels.

Conclusion: In 2014-2015, 157 student papers were scored by two separate raters using the AAC&U Critical Thinking Rubric. Four separate traits (Explanation of Issue; Selecting and Using Evidence; Student's Position, Perspective, and Hypothesis; and Conclusion and Related Outcomes) were rated on a five-point scale of 0=Not Meeting, 1=Meeting Benchmark, 2=Milestone A, 3=Milestone B, and 4=Capstone. The trait scores were averaged to calculate an overall total average score for each student paper. Fourteen percent of the overall total scores from the two raters did not differ, 52% differed less than 1 point, and 12% differed by 1 full point. A total of 22% of the 157 overall total scores had a difference between raters of 1.25 to 2.75 points, and an additional rater was required to score the student paper. The individual raters were fairly consistent in their scores for the Selecting and Using Evidence trait with 89% of the ratings having score differences equal to 0 or 1; followed by Explanation of Issue trait with 84%, and the Conclusion and Related Outcomes with 83% of raters' scores having differences of 0 or 1. Student's Position, Perspective, and Hypothesis seemed to be the critical thinking trait in which raters were least consistent with 81% of the scores differing by 0 or 1.

Nineteen percent of the 157 critical thinking assessments achieved an overall total average score that after rounding would be classified at the Milestone B or Capstone performance levels. Over 1% of the student papers attained an overall total average score at the Capstone performance level, 18% scored at the Milestone B level, 52% at Milestone A, 25% at Meeting Benchmark, and 5% scored at the Not Meeting Benchmark performance level. For the Explanation of Issue trait 32% of student papers assessed achieved the Milestone B or Capstone performance levels, 25% for the Selecting and Using Evidence trait, 20% for the Student's Position, Perspective, and Hypothesis trait, and 16% of student papers assessed achieved the Milestone B or Capstone performance levels for the Conclusion and Related Outcomes trait.

The orientation training for the raters was fairly effective with 66% of the raters' scores differing less than one point. Students scoring at the Capstone or Milestone B levels varied from a high of 31.8% (Explanation of Issue) to a low of 15.9% (Conclusion and Related Outcomes) with Selecting Evidence (24.8%) and Student's Position/Perspective/Hypothesis (20.3%) falling between. However, those students scored as not meeting benchmark performance level ranged from 1.9% (Explanation of Issue) to 6.4% (Student's Position/Perspective/Hypothesis). There appears to be significant work that needs to be accomplished in assisting students with attaining the benchmark level of critical thinking.