



Analysis of Artifacts from Marshall's Senior Capstone Courses

Academic Year 2024 – 2025

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Recommendations from the 2024 Summer Assessment Team

The Summer Assessment Team made the following recommendations:

We feel it is important to improve our ability to determine whether (or not) Marshall's graduating seniors make significant gains in critical thinking and written communication between matriculation and graduation. To do this, we currently use capstone projects that align to our critical thinking and written communication rubrics. We adapted our critical thinking rubric from two rubrics (Critical Thinking and Inquiry and Analysis) developed and normed by the American Association of Colleges and Universities (AAC&U) and adapted our written communication rubric from the AAC&U's rubric as well. We recognize, however, that capstone projects will vary by discipline, with some students' projects emphasizing other outcomes, e.g., Creative Thinking or Quantitative Thinking, that are also part of Marshall University's Baccalaureate Degree profile (BDP). At present, we feel the most important thing is that we increase the number of **either capstone or other senior-level artifacts** faculty make available to us to assess critical thinking and written communication **and** other BDP outcomes as appropriate to their disciplines. To accomplish this, plan to do the following:

1. Work with the Marshall University Online Design Center to assist faculty in making project to outcome alignments in Blackboard. **Please refer to this year's recommendations.**
2. Share the critical thinking and written communication rubrics we currently use during meetings with faculty at either college or departmental levels. If faculty indicate their capstone projects do not align to these rubrics, ask them to consider using (or developing if one does not already exist) at least one assignment at the 300/400 level that does address the outcomes articulated in these rubrics and align it to the critical thinking/written communication outcome in Blackboard. **Please refer to this year's recommendations.**
3. Ask faculty to align ALL senior capstone assignments to the appropriate outcomes of the BDP. This will help to enrich our BDP assessment with a larger population of artifacts from 300/400 level courses. **Although to my knowledge this request was not made this year, we had examples of capstone artifacts in each of our BDP assessments this year.**

Executive Summary

Background

In June 2017 the Assessment Team conducted a pilot assessment in which they scored a small sample of capstone project artifacts using the American Association of Colleges and Universities' (AAC&U's) *Critical Thinking* and *Written Communication* Value rubrics. Given the difficulty we have experienced over the years in drawing representative samples of seniors to complete either the *Collegiate Learning Assessment (CLA+)* or Marshall's Senior Assessment, we recommended that staff from the Office of Assessment and Quality Initiatives encourage degree programs' capstone instructors to align their capstone assignments to the "Capstone Critical Thinking" outcome in Blackboard and to require students to submit their final projects using Blackboard's assignment module. We recommended that these discussions be incorporated into larger discussions regarding the process of creating assignments in Blackboard and aligning them to appropriate outcomes of Marshall's Baccalaureate Degree Profile (BDP). We felt that this had the potential to allow us to evaluate a truly random sample of artifacts from multiple degree programs and to apply validated rubrics to assess work that students complete as part of their degree programs. Staff from the Office of Assessment and Quality Initiatives and the Online Design Center met with chairs and deans in most of Marshall's academic colleges during academic year 2017-2018 to ask that they encourage capstone instructors to follow the instructions outlined above. This year marks our seventh summer (since the initial pilot project) to assess senior capstone projects. The number of usable senior capstone artifacts submitted during academic year 2024-2025 was X from X academic disciplines. From these, we sampled 119 artifacts for assessment. These artifacts came from disciplines within the Colleges of Liberal Arts, Business, Health Professions, and Science.

Procedures for 2025 Assessment

General Procedures

Seven faculty representing the Colleges of Business, Liberal Arts, and Science served as the assessment team for this project. They evaluated each capstone artifact using a rubric to evaluate *Critical Thinking* that was modified from AAC&U's *Critical Thinking* and *Inquiry and Analysis* value rubrics (please refer to supporting documentation at the end of this report to view the resulting rubric). We used AAC&U's *Written Communication* Value rubric to evaluate students' writing skills. This project was coordinated by the Office of Assessment and Quality Initiatives.

Scoring Procedures

Evaluators assessed each artifact using the following scale:

Scoring Codes	
1	The artifact demonstrated Level 1 performance.
2	The artifact demonstrated Level 2 performance.
3	The artifact demonstrated Level 3 performance.
4	The artifact demonstrated Level 4 performance.

Please see the supporting information that follows this summary for a detailed explanation of scoring procedures.

General Information about the Sample

Of the 119 artifacts in our sample, 39 were from the Lewis College of Business, 15 from the College of Health Professions, 20 from the College of Liberal Arts, and 45 from the College of Science. One capstone assignment did not require students to complete work that aligned with the last two traits of the *Critical Thinking* rubric (student's position OR design process and analysis and conclusions and related outcomes OR conclusions), leaving 105 artifacts aligning to those traits.

Results and Analysis

One challenge in reporting results of the capstone assessment is that, although we assessed 119 artifacts for *Critical Thinking* and for *Written Communication*, we scored each artifact for four traits of *Critical Thinking* and five traits of *Written Communication*. This process had the potential of resulting in a total of 476 total trait scores for *Critical Thinking* and 595 for *Written Communication*. The chart below provides the total **scorable** traits for each outcome, along with mean scores, standard deviations, and frequency counts.

Outcome	Trait (AAC&U adapted rubric [CT] and rubric [WC])	Total Traits Aligned	Mean Score (SD)	Number of Students Scoring 2.5 – 4	Number of Students Scoring 3.5 – 4
Critical Thinking	Issues/Topic	119	2.93 (0.56)	106 (89%)	29 (24%)
	Evidence/ Existing Knowledge	119	2.87 (0.57)	104 (87%)	28 (24%)
	Position/ Analysis	105	2.91 (0.54)	95 (91%)	28 (27%)
	Conclusions	105	2.87 (0.61)	89 (85%)	27 (26%)
Total for Critical Thinking		448			
Written Communication	Context/ Purpose	119	3.04 (0.49)	110 (92%)	38 (32%)
	Content	119	2.93 (0.55)	105 (88%)	33 (28%)
	Genre	119	2.87 (0.57)	107 (90%)	30 (25%)
	Evidence	119	3.00 (0.55)	109 (92%)	43 (36%)
	Syntax/ Mechanics	119	2.89 (0.54)	105 (88%)	23 (19%)
Total for Written Communication		595			

A series of paired-samples *t*-tests were used to determine whether there were significant differences among trait means for each outcome. We used Bonferroni adjusted alpha levels of .005 (for Written Communication) and .008 (for Critical Thinking) to control for Type 1 error. These analyses showed no significant differences between any pairs of traits for *Critical Thinking*.

Written Communication: The mean score for context and purpose of writing was significantly higher than those for genre and disciplinary conventions and control of syntax and mechanics. There were no significant differences between any other pairs of means.

Frequency counts showed that the percentage of students scoring between 3.5 and 4.0 on each trait of the *Critical Thinking* rubric ranged from 24% (issues OR topic, evidence OR existing knowledge) to 27% (position OR analysis). Receiving a score in this range indicates that at least one reviewer gave the trait a score of “4,” the highest score possible on the rubric used. The percentage of students scoring between 2.5 and 4.0 ranged from 85% (conclusions and related outcomes OR conclusions) to 91% (position or analysis). In this range, the artifacts that did not appear in the 3.5-4.0 range would have received at least one score of “3,” which is generally considered an acceptable score for senior level work. Only between 9% and 15% of all artifacts scored below this range on any trait.

Frequency counts showed that the percentage of students scoring between 3.5 and 4.0 on each trait of the *Written Communication* rubric ranged from 19% (control of syntax and mechanics) to 36% (sources and evidence). The percentage of students scoring between 2.5 and 4.0 ranged from 88% (genre and disciplinary conventions and Content) to 92% (sources and evidence and context and purpose of writing). Only between 8% and 12% of artifacts scored below this range on any trait.

Conclusion

Across all traits of *Critical Thinking*, on average 90% (as compared to 88% in 2024, 78% in 2023, 87% in 2022, and 72% in 2021) of students scored in the range of 2.5 to 4.0. Although there is room for improvement, we emphasize that scoring in this range indicates that at least one reviewer rendered scores of either “3” or “4.” The consensus of the reviewers was that they considered a score of “3” to be acceptable for seniors, with a score of “4” reserved for truly outstanding work. The latter score (4) was given by at least one reviewer to approximately 28% of our sample, which was from 15% in 2024, 13% in 2023, and 25% in 2022.

As has been the pattern over the years, students continued to have slightly higher scores on the traits of *Written Communication* than on those of *Critical Thinking*, with 90% (as compared to 92% in 2024, 86% in 2023, 88% in 2022, and 84% in 2021) of students scoring 2.5 or higher on average across all traits of *Written Communication*.

Overall, 2025 results suggest relatively even performance across all traits of *Critical Thinking* and identified context and purpose of writing, as a significant strength for *Written Communication*.

Recommendations from the 2025 Summer Assessment Team

As the General Education Revision Task Force continues its deliberations, it may be advisable to query undergraduate degree programs to determine the focus of each discipline’s capstone experience. We note that during the past three-year rotation, students have completed artifacts aligned to these BDP outcomes *Inquiry-Based Thinking*, *Information Literacy*, *Integrative Thinking*, *Metacognitive Thinking*, *Ethical and Civic Thinking*, and *Communication Fluency*. We suggest that it would be advisable to incorporate the assessment of capstone artifacts into the BDP assessment.



Supporting Documentation



Capstone Artifact Assessment

Academic Year 2024 – 2025

Outcomes Assessed: Modified AAC&U Rubrics

Outcome	Abbreviation	Traits	Abbreviations
Critical Thinking or Inquiry and Analysis	CT	Explanation of Issues OR Topic Selection	Issues
		Evidence OR Existing Knowledge	Evidence
		Student's Position OR Design Process and Analysis	Position
		Conclusions and Related Outcomes/Conclusions	Conclusions
Written Communication	WC	Context and Purpose of Writing	Context/Purpose
		Content Development	Content
		Genre and Disciplinary Conventions	Genre
		Sources and Evidence	Evidence
		Control of Syntax and Mechanics	Syntax/Mechanics

Review Procedures

- Each artifact had two independent raters and usable scores on the 1 – 4 scale were determined in the following manner:
 - If raters assigned the same score, that became the score for the artifact.
 - If raters' scores differed by one point, e.g., Rater 1 assigned a score of 1 and Rater 2 a score of 2, the final score was the mean, i.e., 1.5.
 - If raters' scores differed by more than one point, e.g., Rater 1 assigned a score of 1 and Rater 2 a score of 3, the raters met to discuss the rationale for their scores to see if they could agree on a score or, at minimum, scores that differed by no more than one point.
 - If raters' scores differed by more than one point and, after discussion, they were not able to resolve the differences, a third rater was assigned to review the artifact.
 - A third reader was used for two artifacts in this sample.

Rules for arriving at final scores when there are three raters:
these rules were followed for all assessments conducted.

- If the third rater's score agreed with one of the first two, the score with the two agreements was used.
- If the first two raters' scores were two points apart, e.g., 1 and 3 and the third rater's score was in the middle, e.g., 2, the third rater's score was used.
- If the first two raters' scores were two points apart, e.g., 1 and 3, and the third rater's score was a "4", the two scores closer together were averaged, e.g., 3.5.
- If the first two raters' scores were three points apart, e.g., 1 and 4, the third rater's score was averaged with the closest other rater; e.g., if the third rater's score was 3, the final score was 3.5; if the third rater's score was 2, the final score was 1.5.

Interrater Reliability

- We conducted interrater reliability analyses using the Cohen's Kappa statistical procedure. In so doing, we used the following rules, similar to those suggested Stellmack, Kohneim-Kalkstein, Manor, Massey, & Schmitz (2009):
 - Since our scoring procedure was to average final scores between two raters when scores differed by only one point, we used that averaged score (e.g., 1.5) as the score for both raters, counting it as an agreement in the interrater reliability analysis.
 - For scores that were two or more points apart, the original score of each reviewer was used in the analysis. Therefore, these scores were counted as disagreements.

Critical Thinking Rubric

Modified from AAC&U Critical Thinking and Inquiry and Analysis Value Rubrics (Page 1)

This rubric was created using the Association of American Colleges and Universities (AAC&U) Critical Thinking VALUE Rubric. Retrieved from <https://www.aacu.org/value-rubrics>

AAC&U Value Rubrics (Critical Thinking and Inquiry/Analysis Combined)

Traits	Level 1	Level 2	Level 3	Level 4
Explanation of Issues OR Topic Selection	Issue/problem to be considered critically is stated without clarification or description. OR Identifies a topic that is far too general and wide-ranging as to be manageable and doable.	Issue/problem to be considered critically is stated, but description leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown. OR Identifies a topic that, while manageable/doable, is too narrowly focused and leaves out relevant aspects of the topic.	Issue/problem to be considered critically is stated, described, and clarified so that understanding is not seriously impeded by omissions. OR Identifies a focused and manageable/doable topic that appropriately addresses relevant aspects of the topic.	Issue/problem to be considered critically is stated clearly and described comprehensively, delivering all relevant information necessary for full understanding. OR Identifies a creative, focused, and manageable topic that addresses potentially significant yet previously less-explored aspects of the topic.
Evidence (Selecting and using information to investigate a point of view or conclusion) OR Existing Knowledge, Research, and/or Views	Information is taken from sources without any interpretation/evaluation. Viewpoints of experts are taken as fact, without question. OR Presents information from irrelevant sources representing limited points of view/approaches.	Information is taken from sources with some interpretation/evaluation, but not enough to develop a coherent analysis of synthesis. Viewpoints of experts are taken as mostly fact, with little questioning. OR Presents information from relevant sources representing limited points of view/approaches.	Information is taken from sources with enough interpretation/evaluation to develop a coherent analysis or synthesis. Viewpoints of experts are subject to questioning. OR Presents in-depth information from relevant sources representing various points of view/approaches.	Information is taken from sources with enough interpretation/evaluation to develop a comprehensive analysis or synthesis. Viewpoints of experts are questioned thoroughly. OR Synthesizes in-depth information from relevant sources representing various points of view/approaches.
Student's Position (perspective, thesis/hypothesis) OR Design Process and Analysis	Specific position (perspective, thesis/hypothesis) is stated, but is simplistic and obvious. OR <ul style="list-style-type: none"> • Inquiry design demonstrates a misunderstanding of the methodology or theoretical framework. • Lists evidence, but it is not organized and/or is unrelated to the focus. 	Specific position (perspective, thesis/hypothesis) acknowledges different sides of an issue. OR <ul style="list-style-type: none"> • Critical elements of the methodology or theoretical framework are missing, incorrectly developed, or unfocused. • Organizes evidence, but the organization is not effective in revealing 	Specific position (perspective, thesis/hypothesis) takes into account the complexities of an issue. Others' points of view are acknowledged within position (perspective, thesis/hypothesis). OR <ul style="list-style-type: none"> • Critical elements of the methodology or theoretical framework are appropriately developed; however, more subtle 	Specific position (perspective, thesis/hypothesis) is imaginative, taking into account the complexities of an issue. Limits of position (perspective, thesis/hypothesis) are acknowledged. Others' points of view are synthesized within position (perspective, thesis/hypothesis). OR <ul style="list-style-type: none"> • All elements of the methodology or

Critical Thinking Rubric

Modified from AAC&U Critical Thinking and Inquiry and Analysis Value Rubrics (Page 2)

This rubric was created using the Association of American Colleges and Universities (AAC&U) Critical Thinking VALUE Rubric. Retrieved from <https://www.aacu.org/value-rubrics>

Page 2

Traits	Level 1	Level 2	Level 3	Level 4
		important patterns, differences, or similarities.	elements are ignored or unaccounted for. • Organizes evidence to reveal important patterns, differences, or similarities related to focus.	theoretical framework are skillfully developed. Appropriate methodology or theoretical frameworks may be synthesized from across disciplines or from relevant subdisciplines. • Organizes and synthesizes evidence to reveal insightful patterns, differences, or similarities related to focus.
Conclusions and related outcomes (implications and consequences) OR Conclusions	Conclusion is inconsistently tied to some of the information discussed; related outcomes (consequences and implications) are oversimplified. OR States an ambiguous, illogical, or unsupportable conclusion from Inquiry findings.	Conclusion is logically tied to information (because information is chosen to fit the desired conclusion); some related outcomes (consequences and implications) are identified clearly. OR States a general conclusion that, because it is so general, also applies beyond the scope of the inquiry findings.	Conclusion is logically tied to a range of information, including opposing viewpoints; related outcomes (consequences and implications) are identified clearly. OR States a conclusion focused solely on the Inquiry findings. The conclusion arises specifically from and responds specifically to the inquiry findings.	Conclusions and related outcomes (consequences and implications) are logical and reflect student's informed evaluation and ability to place evidence and perspectives discussed in priority order. OR States a conclusion that is a logical extrapolation from the inquiry findings.

Written Communication AAC&U Value Rubric

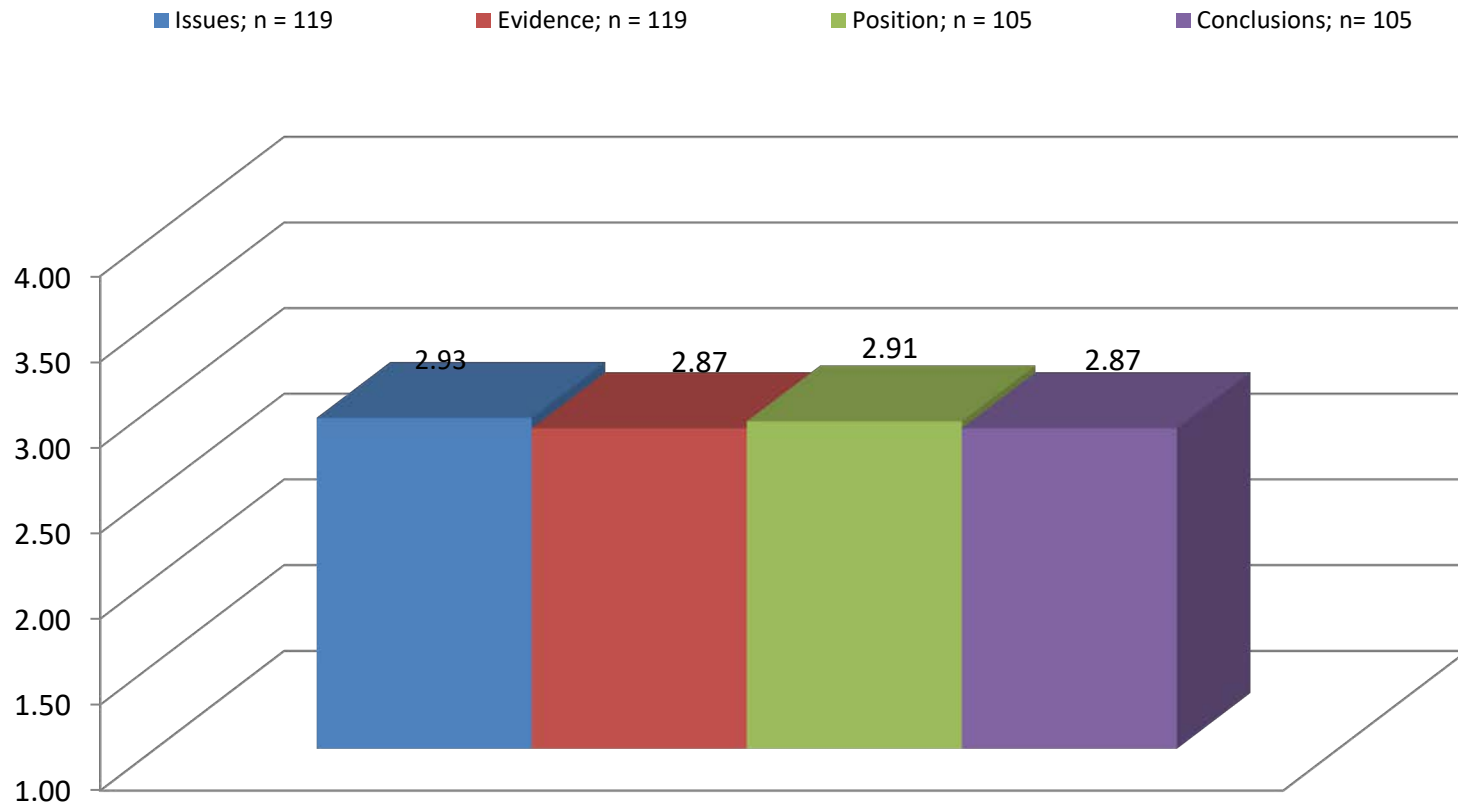
AAC & U Written Communication Value Rubric

Traits	N/A	Level 1	Level 2	Level 3	Level 4
Context of and Purpose for Writing <i>Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).</i>	Does not apply to this assignment.	Demonstrates minimal attention to context, audience, purpose, and to the assigned tasks(s) (e.g., expectation of instructor or self as audience).	Demonstrates awareness of context, audience, purpose, and to the assigned tasks(s) (e.g., begins to show awareness of audience's perceptions and assumptions).	Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).	Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.
Content Development	Does not apply to this assignment.	Uses appropriate and relevant content to develop simple ideas in some parts of the work.	Uses appropriate and relevant content to develop and explore ideas through most of the work.	Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.	Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding, and shaping the whole work.
Genre and Disciplinary Conventions <i>Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields (please see glossary).</i>	Does not apply to this assignment.	Attempts to use a consistent system for basic organization and presentation.	Follows expectations appropriate to a specific discipline and/or writing task(s) for basic organization, content, and presentation	Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task(s), including organization, content, presentation, and stylistic choices	Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task (s) including organization, content, presentation, formatting, and stylistic choices
Sources and Evidence	Does not apply to this assignment.	Demonstrates an attempt to use sources to support ideas in the writing.	Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate for the discipline and genre of the writing.	Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.	Demonstrates skillful use of high-quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the writing
Control of Syntax and Mechanics	Does not apply to this assignment.	Uses language that sometimes impedes meaning because of errors in usage.	Uses language that generally conveys meaning to readers with clarity, although writing may include some errors.	Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.	Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.

Critical Thinking: Overall Analysis

Mean Scores on a scale of 1 – 4, with 4 being the highest possible score.

AAC&U Rubric

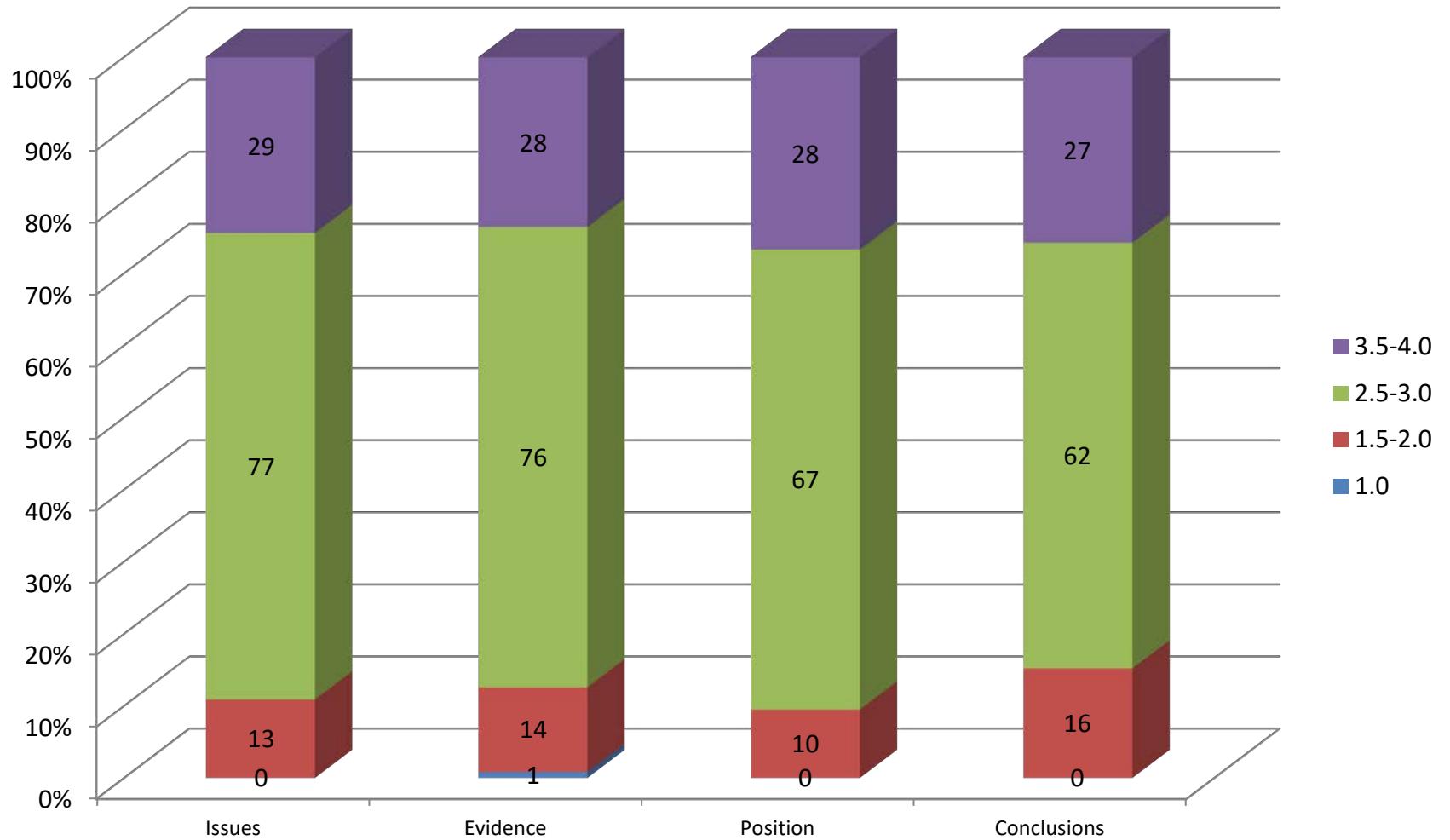


Critical Thinking

Number of artifacts scoring at each performance level

Trait/ Performance Level	Issues	Evidence	Position	Conclusions	Total
1.0	0	1 (1%)	0	0	1 (0%)
1.5 – 2.0	13 (11%)	14 (12%)	10 (10%)	16 (15%)	53 (12%)
2.5 – 3.0	77 (65%)	76 (64%)	67 (64%)	62 (59%)	282 (63%)
3.5 – 4.0	29 (24%)	28 (24%)	28 (27%)	27 (26%)	112 (25%)
Totals	119	119	105	105	448

Critical Thinking



Critical Thinking

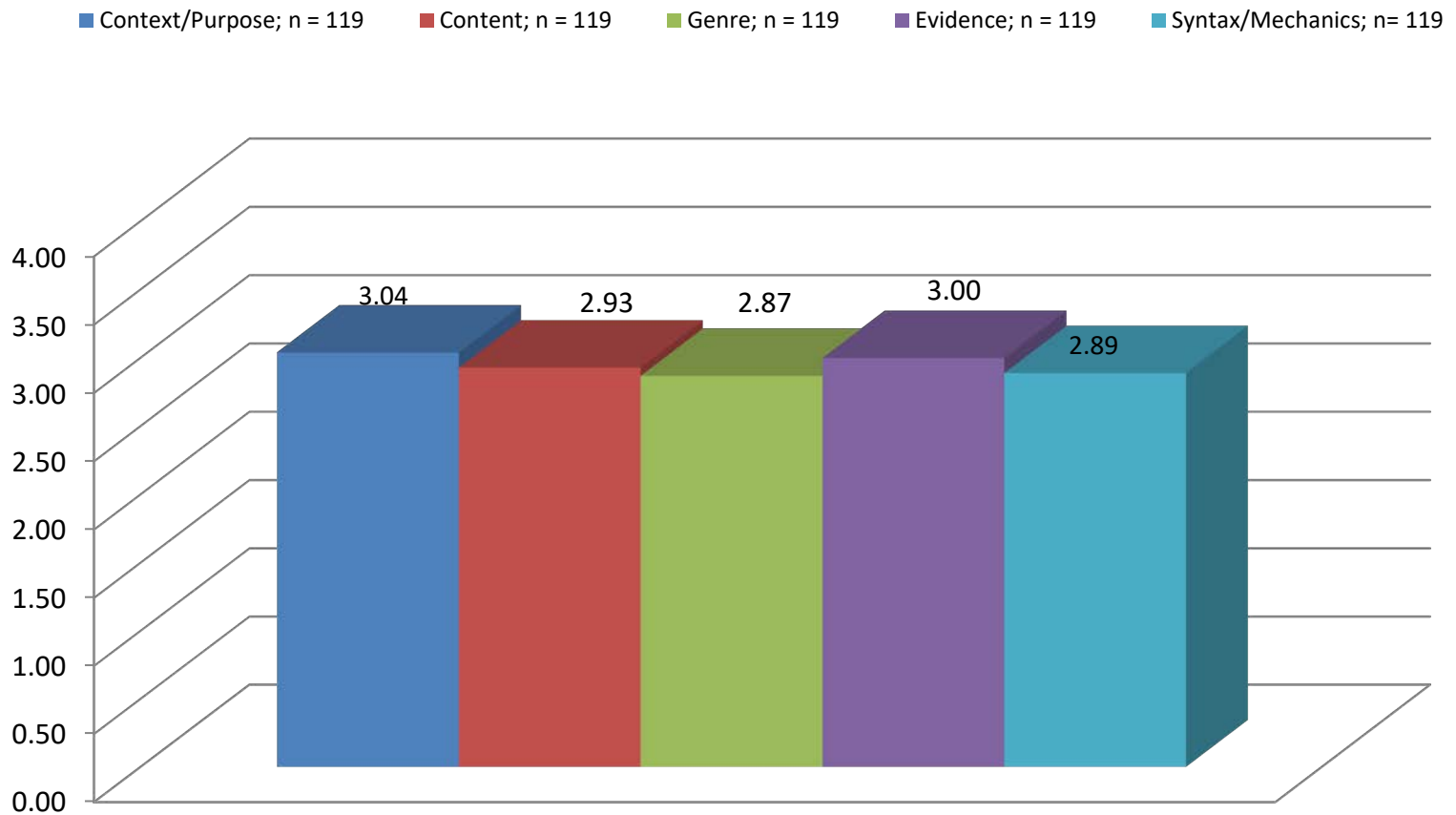
Inter-Rater Agreement Results

Trait/ Performance Level	Issues Cohen's Kappa (Liberal) = .921	Evidence Cohen's Kappa (Liberal) = .911	Position Cohen's Kappa (Liberal) = .925	Conclusions Cohen's Kappa (Liberal) = .912
Agree on Score	70 (59%)	58 (49%)	46 (44%)	53 (50%)
Difference = 1 point	42 (35%)	53 (45%)	53 (50%)	45 (43%)
Difference = 2 points	7 (6%)	8 (7%)	6 (6%)	7 (7%)
Difference = 3 points	0	0	0	0
Total	119	119	105	105

Written Communication: Overall Analysis

Mean Scores on a scale of 1 – 4, with 4 being the highest possible score.

AAC&U Rubric

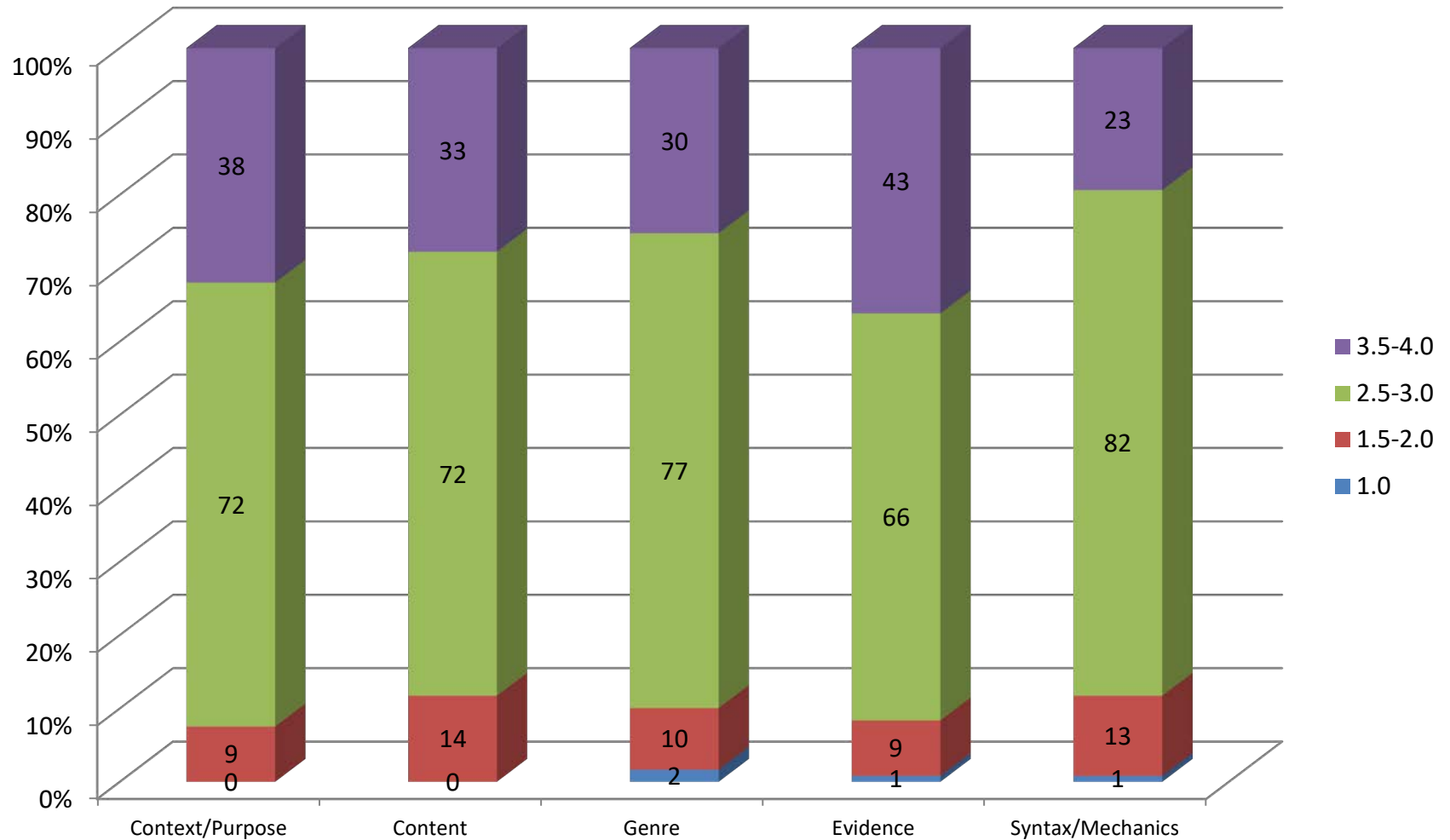


Written Communication

Number of artifacts (with usable scores) scoring at each performance level

Trait/ Performance Level	Context/ Purpose	Content	Genre	Evidence	Syntax/ Mechanics	Total
1.0	0	0	2 (2%)	1 (1%)	1 (1%)	4 (1%)
1.5 – 2.0	9 (8%)	14 (12%)	10 (8%)	9 (8%)	13 (11%)	55 (9%)
2.5 – 3.0	72 (61%)	72 (61%)	77 (65%)	66 (55%)	82 (39%)	369 (62%)
3.5 – 4.0	38 (32%)	33 (28%)	30 (25%)	43 (36%)	23 (19%)	167 (28%)
Totals	119	119	119	119	119	595

Written Communication



Written Communication

Inter-Rater Agreement Results

Trait/ Performance Level	Context/Purpose Cohen's Kappa (Liberal) = .940	Content Cohen's Kappa (Liberal) = .924	Genre Cohen's Kappa (Liberal) = .867	Evidence Cohen's Kappa (Liberal) = .944	Syntax/Mechanics Cohen's Kappa (Liberal) = .963
Agree on Score	68 (57%)	59 (50%)	51 (43%)	52 (44%)	74 (62%)
Difference = 1 point	46 (39%)	53 (45%)	56 (47%)	62 (52%)	42 (35%)
Difference = 2 points	5 (4%)	7 (6%)	12 (10%)	4 (3%)	2 (2%)
Difference = 3 points	0	0	0	1 (1%)	1 (1%)
Total	119	119	119	119	119

References

Association of American Colleges and Universities (AAC&U). (2009). *Critical thinking VALUE rubric*. Retrieved from <https://www.aacu.org/value/rubrics/critical-thinking>

Association of American Colleges and Universities (AAC&U). (2009). *Inquiry and analysis VALUE rubric*. Retrieved from <https://www.aacu.org/value/rubrics/inquiry-analysis>

Association of American Colleges and Universities (AAC&U). (2009). *Written communication VALUE rubric*. Retrieved from <https://www.aacu.org/value/rubrics/written-communication>

Stellmack, M.A., Kohneim-Kalkstein, Y. L, Manor, J. E., Massey, A. R., & Schmitz, J. A. P. (2009). An assessment of reliability and validity of a rubric for grading APA-style introductions. *Teaching of Psychology*, 36, 102-107.