

## Critical Thinking in Foundational Studies: Results of the 2017 Assessment Project

### Executive Summary

At the conclusion of the Higher Learning Commission's Assessment Academy, ISU developed a plan to systematically assess key Foundational Studies learning goals using the [AAC&U's VALUE rubrics](#). In fall 2016, the University College Council invited instructors to submit student artifacts focused on critical thinking. Fifty of these documents met the rubric's parameters, and in spring 2017, they were scored by a team of faculty and staff from the Assessment Council and the Faculty Center for Teaching Excellence.

Overall, these artifacts earned an average score of 2.3 based on the rubric's four-point scale, a score that accords with the level of performance established for college sophomores. Detailed results are provided below. Because of the small size of the study, the results are not conclusive, but they should inform discussions about student achievement *in* and faculty expectations *for* critical thinking, as well as guide future study.

### Critical Thinking Rubric

The AAC&U's Valid Assessment of Learning in Undergraduate Education (VALUE) rubrics were developed by faculty members and assessment experts from more than one hundred institutions as a means of assessing essential learning outcomes. They have the added advantage of allowing institutions to provide consistent, comparable information about student learning as it is evidenced in assignments faculty already are requiring students to complete.

The AAC&U VALUE rubric defines critical thinking as "A habit of mind characterized by the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion." The rubric assesses performance in five dimensions: 1) Explanation of Issues, 2) Evidence, 3) Influence of Context and Assumptions, 4) Student's Position, and 5) Conclusions and Related Outcomes. Scores in each dimension range from Capstone (4), Milestone (3), Milestone (2), and Benchmark (1). As the AAC&U notes,

[T]he rubrics reflect the collective best thinking and ambitions for learning within higher education in the United States, so it is not unreasonable to say that scores at the two Milestone levels are appropriate for students who have completed the majority of their coursework for an associate's degree, and that scores moving up from Milestone (3) to Capstone (4) are appropriate for those on the cusp of completing a baccalaureate degree. ([On Solid Ground, VALUE Report 2017](#))

The rubric is included in this report as Appendix I.

### Process

The Chair of the University College Council collected student work from fall 2016 Foundational Studies instructors. Staff in the Office of Assessment and Accreditation reviewed these artifacts, eliminated those that could not be scored using the critical thinking rubric, generated a random

identification number for each artifact, and removed all student and instructor information. Associate Professor Terry Dean, who has been trained by AAC&U staff to apply the rubric, offered a training and calibration workshop in February 2017. Participants were encouraged to keep this advice in mind as they scored the artifacts:

- Assess the artifacts; do not grade them. Focus on applying the standards identified in the rubric, not on other standards you might apply if you were awarding grades (the quality of the writing, for example, its adherence to traditional essay form, or its factual accuracy).
- As you read the artifact, link the traits on the rubric to the parts of the artifact that illustrate those traits. (Print the document and make notes on it if you wish.) This will keep you focused and help you choose the appropriate score.
- Review assignment parameters so that you understand what students were expected to do. But assess the artifacts based on the rubric, not on whether or not student met the assignment parameters.
- Report your scores as whole numbers. Possible scores are 4, 3, 2, 1, and 0.
- When in doubt, rely on the language of the rubric and on the definition of critical thinking the rubric is based on.
- Be aware of your own trends in scoring. If your scores change drastically from dimension to dimension (or are always the same), you may want to take a break and then revisit the artifact(s).

Fifteen individuals who attended the workshop subsequently scored student artifacts and provided a list of their overall strengths and weaknesses. To ensure inter-rater reliability, two scorers assessed each artifact. In three cases, the overall average scores differed by more than two points, and so the artifact was scored a third time and the “outlier” score eliminated.

## Results

Overall, scores in the five dimensions ranged from 2.1 to 2.6 and are commensurate with performance expected of second-year college students. As the table below shows, students performed best in the “Explanation of Issues” dimension and least well in “Influence of Context and Assumptions” and “Student’s Position.”

*Table 1: Percent of Student Work Scoring 4-0 in Each Critical Thinking Dimension (All Levels)*

Average Score	2.6	2.4	2.1	2.2	2.3
	Explanation of issues	Evidence	Influence of context and assumptions	Student's position	Conclusions and related outcomes
Score=0	2%	3%	6%	4%	2%
Score=1	12%	16%	25%	30%	20%
Score=2	33%	32%	34%	20%	37%
Score=3	33%	36%	25%	35%	28%
Score=4	20%	13%	10%	11%	13%

The key difference between a score of “2” (Milestone) and a score of “4” (Capstone) largely is a matter of the breadth and depth of the analysis. For example, according to the critical thinking rubric:

- A “2” explains the issue but “leaves some terms undefined, ambiguities unexplored, boundaries undetermined, and/or backgrounds unknown.” In contrast, a “4” describes the issue “clearly and . . . comprehensively, delivering all relevant information necessary for full understanding.”
- A “2” provides “some interpretation/evaluation” of the evidence, “but not enough to develop a coherent analysis or synthesis. Viewpoints of experts are taken as mostly fact, with little questioning.” A “4,” on the other hand, offers a “comprehensive analysis or synthesis” of the evidence and “questions others’ viewpoints thoroughly.”
- An artifact earning a “2” in the “Influence of Context and Assumptions” category may question “some” assumption” and identify “relevant contexts when presenting a position.” But in comparison, one that earns a score of 4 “Thoroughly (systematically and methodically) analyzes own and others’ assumptions and carefully evaluates the relevance of contexts when presenting a position.”
- In the “Student’s Position” dimension, a “2” takes a position and “acknowledges different sides of an issue,” but a 4 takes a position that is “imaginative, taking into account the complexities of an issue. Limits of position . . . are acknowledged. Others’ points of view are synthesized within position.”
- Finally, “Conclusions” in a “2” seem logical “because information is chosen to fit the desired conclusion,” and they identify some consequences and implications clearly. But in a “4,” “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.”

In addition to applying the rubric to the student artifacts, scorers provided a summary of their overall strengths and weaknesses. Typical comments follow:

Strengths (based on artifacts earning scores of “3” and “4”)

1. Clear position
2. Strong supporting evidence
3. Thorough explanation, analysis, reflection
4. Effective synthesis of course material
5. Original insights
6. Logical, well supported conclusions

Scorers also cited some common strengths unrelated to the rubric, including students’ ability to follow assignment directions, write effectively, and quote and paraphrase sources appropriately.

Weaknesses (based on artifacts earning scores of “2” or less)

1. Unclear or weakly supported position
2. Lacking or limited explanation, analysis, synthesis, reflection, insight

3. Unexplored/unquestioned assumptions
4. Heavy reliance on personal opinion
5. Failure to consider alternative viewpoints

Other commonly cited weaknesses include students' inability to follow assignment directions and weak writing skills (i.e., organization, grammar, mechanics, sentence structure, style, proofreading).

### Comparison of Results by Course Level

An analysis of scores earned by course level shows no significant difference: They range from an average of 2.16 for the fifteen freshman artifacts to a 2.46 for the five senior-level artifacts. Though only five artifacts came from 200-level courses, their scores are a half point higher than the average (2.82) and so disrupt the expected pattern of achievement. Half of the artifacts came from 300-level courses, and these earned scores lower than those from senior-level courses. But in each dimension and at each course level, the artifacts earned average scores in the "2" range, demonstrating slightly better performance in the "Explanation of Issues" dimension and slightly poorer performance in the "Influence of Context and Assumptions" and "Student's Position" dimensions.

Table 2: Comparison of Scores by Course Level

Comparison of Scores by Course Level						
	Explanation of issues	Evidence	Influence of context and assumptions	Student's position	Conclusions and related outcomes	Average
100-level (N=15)	2.43	2.30	1.90	2.07	2.10	2.16
200-level (N=5)	2.80	2.90	2.80	2.70	2.90	2.82
300-level (N=25)	2.54	2.36	2.13	2.20	2.26	2.30
400-level (N=5)	2.90	2.40	2.30	2.20	2.50	2.46
All (N=50)	2.57	2.40	2.14	2.21	2.30	2.33

Additional analyses of course-level results are included in Appendix II.

### Context: AAC&U Results

The table below depicts the scores ISU students earned in senior-level artifacts in conjunction with those reported by the AAC&U for 2014-16. Because the AAC&U study had very different research parameters (i.e., it is based on a *random* sample of artifacts from *seniors* at twenty-nine four-year institutions), these data should be used to inform future analyses rather than serving as benchmarks for the current ISU critical thinking project. In any case, the data suggest that few students nearing graduation are prepared at the Capstone level. They also suggest that the small sample of ISU student works exhibit strengths and weaknesses similar to those of the much larger AAC&U study: "[S]tudents demonstrate strength in explaining issues and presenting evidence related to the issues. However, students have greater difficulty in drawing conclusions or making sense out of or explaining the importance of the issue studied."

Table 3: ISU (N=5) and AAC&U (N=2419) Senior-Level Critical Thinking Scores

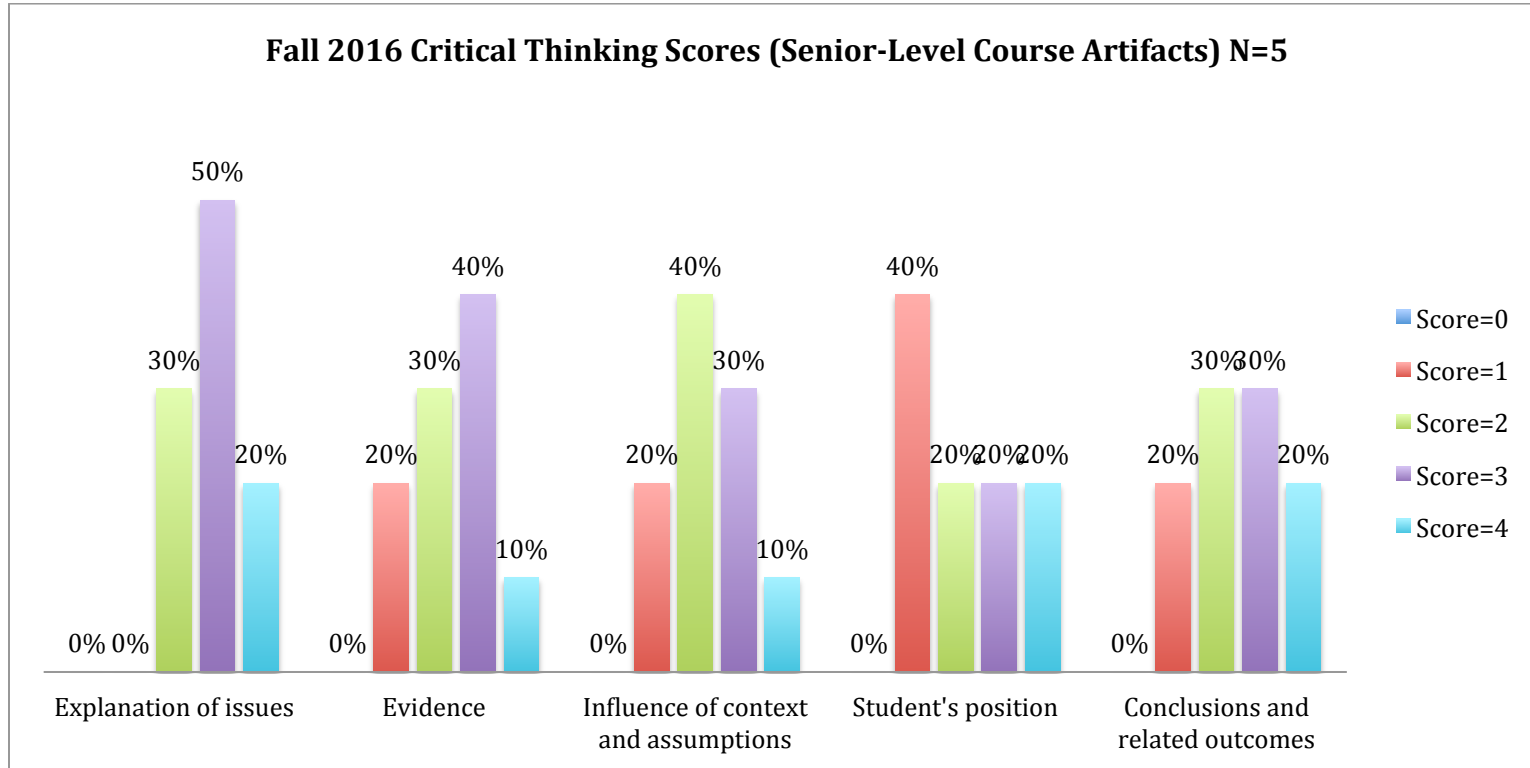
ISU and AAC&U Critical Thinking Scores		4	3	2	1	0
<b>Explanation of issues</b>	ISU	20%	50%	30%	0%	0%
	AAC&U	13%	29%	34%	18%	6%
<b>Evidence</b>	ISU	10%	40%	30%	20%	0%
	AAC&U	7%	27%	39%	20%	8%
<b>Influence of context and assumptions</b>	ISU	10%	30%	40%	20%	0%
	AAC&U	7%	21%	35%	28%	9%
<b>Student's position</b>	ISU	20%	20%	20%	40%	0%
	AAC&U	7%	25%	31%	31%	6%
<b>Conclusions and related outcomes</b>	ISU	20%	30%	30%	20%	0%
	AAC&U	9%	19%	42%	23%	8%

Conclusion

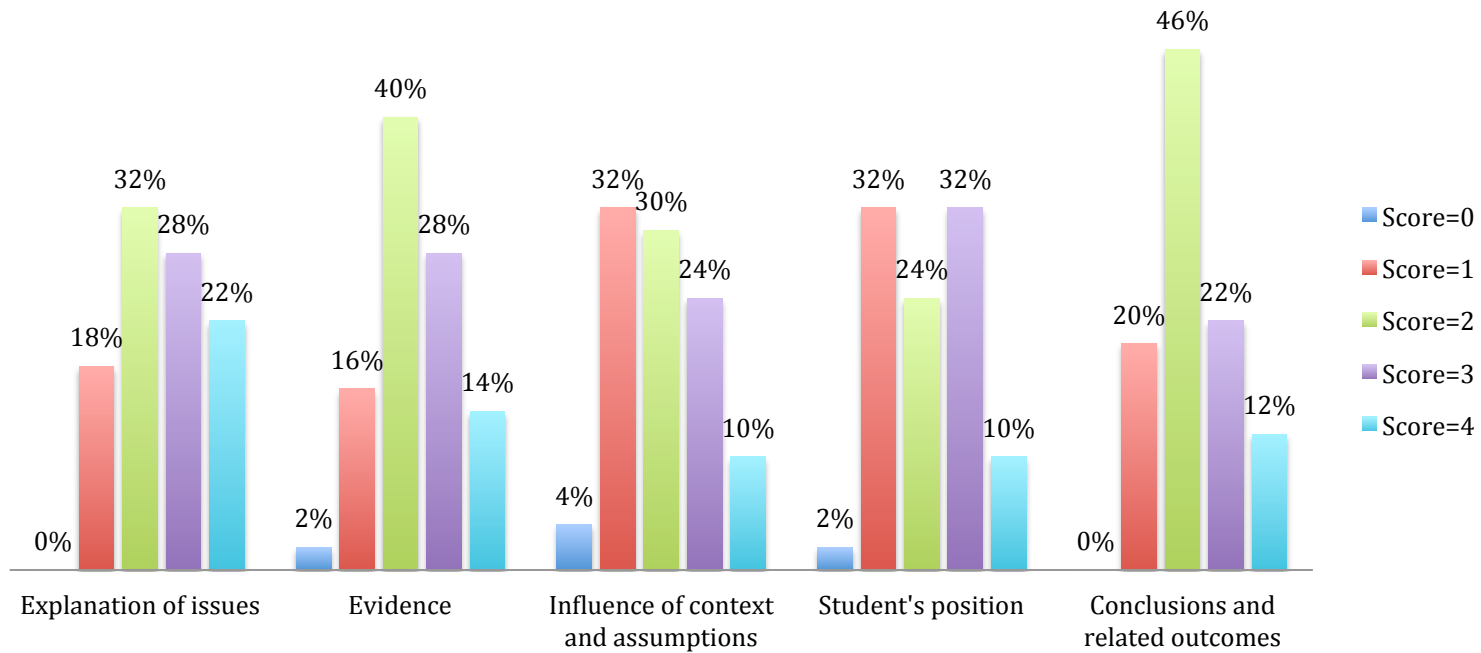
In the context of the AAC&U study, there is one conclusion we can draw about ISU students, even though the number of artifacts we assessed was very small: They need assistance to develop capstone-level critical thinking skills. Potential next steps are suggested below:

1. Offer professional development activities for Foundational Studies faculty to improve pedagogy and course design in order to foster better approaches to teaching critical thinking.
2. Continue to assess students' critical thinking skills so that we can conduct a more conclusive analysis of their abilities. Conducting an internal assessment of the artifacts ISU will submit to the Multi-State Collaborative to Improve Student Learning will contribute to this research.
3. Ensure that this study informs the objectives of the Foundational Studies assessment program—i.e., providing the University College Council another avenue for understanding the strengths and weaknesses of the Foundational Studies program, helping the Faculty Center for Teaching Excellence to plan its professional development offerings, and most importantly, to allow faculty insight into what students are and are not learning.

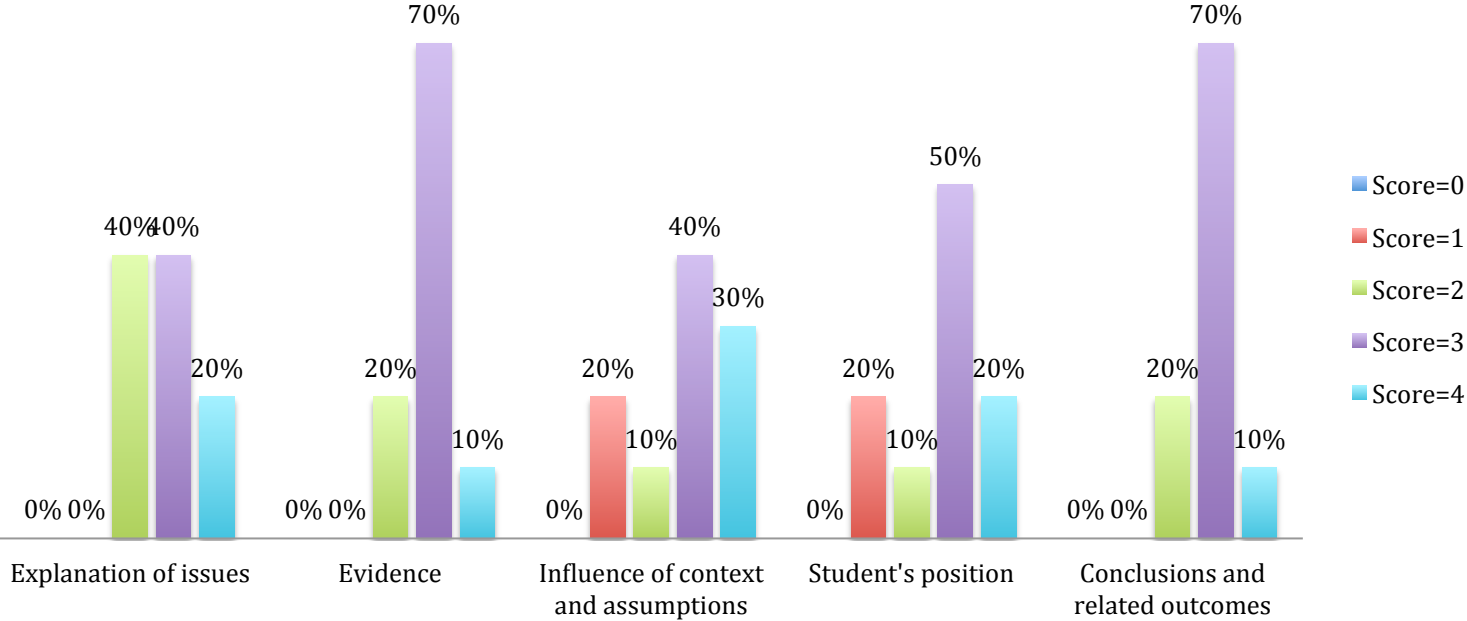
Appendix II



Fall 2016 Critical Thinking Scores (Junior-Level Course Artifacts) N=25

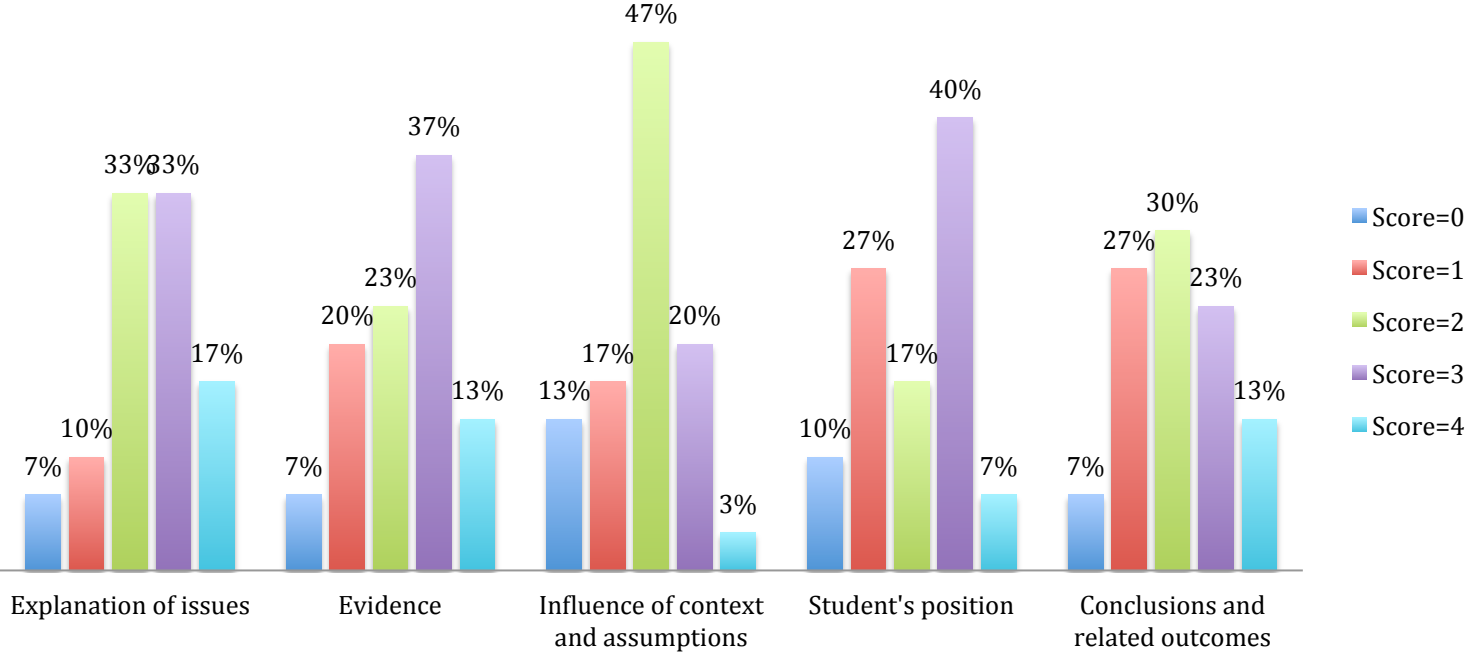


**Fall 2016 Critical Thinking Scores (Sophomore-Level Course Artifacts) N=5**





Fall 2016 Critical Thinking Scores (Freshman-Level Course Artifacts) N=15



### Fall 2016 Critical Thinking Scores by Level

■ Lower-Division Average   ■ Upper-Division Average

