2023 Assessment of Critical Thinking Report
California State University, Monterey Bay

The Critical Thinking Assessment group met for three days in June of 2023 to assess student work with the updated Critical Thinking Assessment Rubric. One hundred and twenty pieces of student work were evaluated from several GWAR courses from two CSUMB majors. In addition, student work from a section of HCOM 200, Critical Thinking, was evaluated. Scores on the various elements of critical thinking, differences between the upper division and lower division student work, and relevant changes regarding the inclusion of the Critical Thinking, a GE Program Learning Outcome (GEPLO) in GE Course Certification and Recertification are briefly discussed.

These data, while probably not representative broadly of upper division and lower division students, constitute a baseline for critical thinking assessment. During the 22/23 academic year, both Critical Thinking and Integrative Knowledge, GE Program Learning Outcomes, were formally incorporated into the GE Course Certification and recertification process. That is, all new courses coming through GE course consent, as well as each GE Area coming up for recertification, will incorporate elements of both GE Program Learning Outcomes into these courses. Area B was completed last year, and a different GE Area will go through recertification in AY 23/24. CSUMB will soon be able to see the impact of explicit teaching being devoted to critical thinking in GE courses.

In the following examination and discussion of these data, it is important to remember that the lower division coursework is explicitly aligned more closely with five elements of the Critical Thinking GEPLO; elements drawn from a campus-wide survey several years ago. The GWAR courses/assignments are probably more implicitly aligned. Student performance in the GWAR assignments may be better understood as emergent in students' overall CSUMB experience rather than responding to explicit GWAR curriculum.

It is also important to acknowledge that the assignments used in this assessment may not be valid measures of these elements of critical thinking. That is, there is some risk in assuming too much generalizability from these data. That said, among faculty across the university, the majority indicate that critical thinking is very important and the majority indicate that they teach to it explicitly. If these measures (assignments) aren't valid, then which ones are? If we don't see critical thinking here, where would we? My hope is that readers will be willing to assume some level of validity and be ready to consider and make decisions based on the data we have. Given the small sample size, I chose to stay with presenting the data visually and with descriptive statistics, mean and standard deviation of the mean. For those who desire a different or more rigorous approach, the data are available through TLA. Standard deviations varied between 35 and 50% of the means.

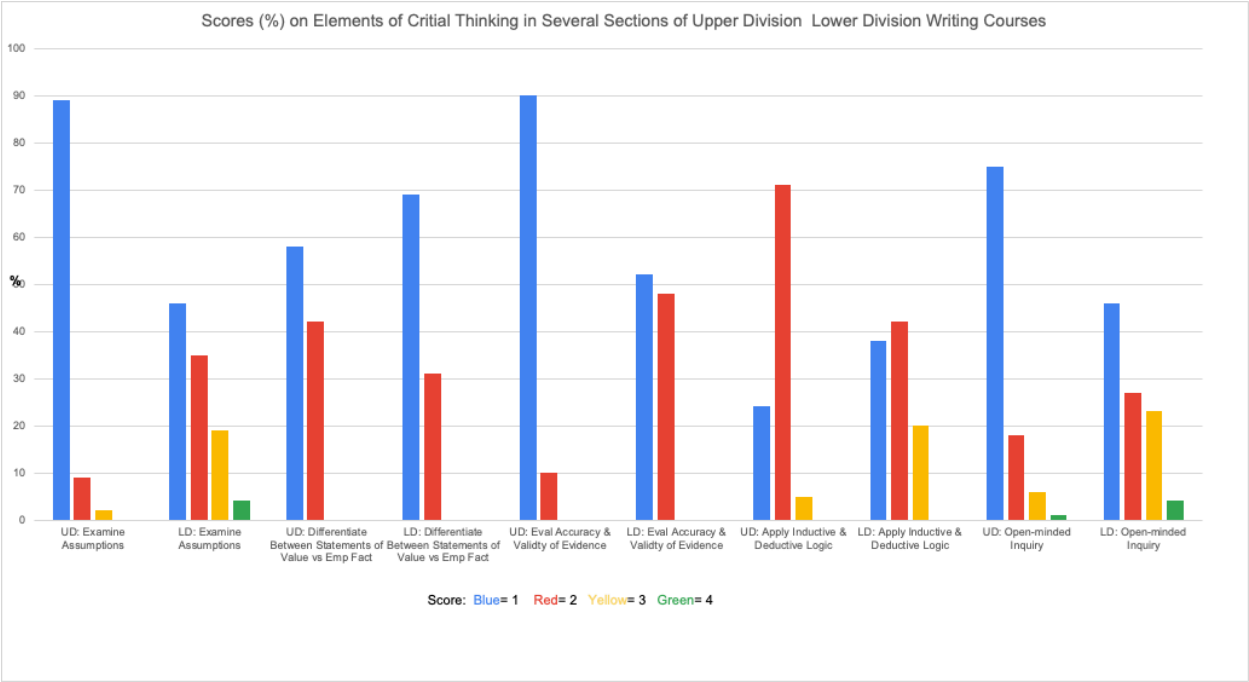

Figure 1: Bars represent the percentage of students who scored 1, 2, 3, or 4 on the five different elements of critical thinking.

	UD: Examine Assumptions	LD: Examine Assumptions	UD: Differentiate Between Statements of Value vs Emp Fact	LD: Differentiate Between Statements of Value vs Emp Fact	UD: Eval Accuracy & Validity of Evidence	LD: Eval Accuracy & Validity of Evidence	UD: Apply Inductive & Deductive Logic	LD: Apply Inductive & Deductive Logic	UD: Open-minded Inquiry	LD: Open-minded Inquiry
Mean	1.13	1.85	1.43	1.31	1.10	1.38	1.83	1.88	1.33	1.92
Std dev	0.38	0.83	0.49	0.45	0.30	0.47	0.49	0.72	0.62	0.88
Median	1	2	1	1	1	1	2	2	1	2

Table 1: Mean and standard deviations of raw scores. Standard deviations range from 27 to 47% of means.

Upper Division For all of the elements except one, Figure 1 clearly shows that for this sample, the majority of upper division students performed at the Beginning level. Additionally, in three of the five elements, between 69 and 90% performed at the beginning level. These third year students are still performing at or near our expectation for first year students. For two elements, *Differentiate Between Statements of Value and Empirical Fact*, and *Apply Inductive and Deductive Logic*, 42 and 71% of upper division students respectively scored a 2, (are considered Developing). Only 5% of these third year students scored 3's or are considered proficient.

Lower Division Overall, the lower division students scored better than their upper division peers. It is important to remember that the assignments were different, that this is not an apples to apples comparison. That said, more than 30% of lower division students scored a 2

(developing) in every category but one. Between 18 and 23% of lower division students scored a 3 (proficient) in three categories.

Data Overall Norms around the meaning of standard deviations vary by discipline, but from my perspective, these are small enough that the means represent the overall picture fairly well. The medians indicate that the data skew left, or towards the low scoring side of the scale. This is expected for the lower division students and at odds with our expectations of the upper division students.

Explanations, Influential Factors, and Next Steps Several years ago, the CT Faculty Learning Community explored the literature on teaching critical thinking. One of the papers that stood out was a meta analysis of several hundred studies which found that explicit teaching of the elements of critical thinking had a significant positive effect on student performance and that the expectation that student performance would improve from implicit teaching of critical thinking skills wasn't supported. In consideration of the differences between upper and lower division student performance, it is likely there was more explicit focus on teaching elements of critical thinking in the lower division section. Lobbying the campus for more explicit teaching of critical thinking skills, and supporting teaching on how to teach those skills is likely a worthy investment.

The national discourse on critical thinking includes a large body of research on employers of graduates with BA and BS degrees. These employers speak nearly uniformly of the need for graduates to be able to think critically. While our data are far from conclusive, they don't suggest that our junior level students have well developed critical thinking chops. The campus may wish to consider the importance of critical thinking skills in our graduates as we consider curricular norms. Now that Critical Thinking GEPLO elements are being formally adopted into all GE courses, the stage is set to begin to systematically pull assessment data from the GE Areas that have gone through this process and be able to determine the effect, or not, of these changes. In addition, it is difficult to imagine high quality data coming from assignments that are not well aligned with one or more critical thinking elements. The learning community may wish to use the coming year to look at a variety of assignments submitted to this process, and work with faculty to better align these assignments. Alternatively, the group might work to develop signature assignments that could be adopted across large numbers of sections. Signature assignments would eliminate a great deal of the variability inherent when comparing student performance across assignments, and give greater confidence in the results of this work.