

INNOVATING THE ASSESSMENT OF CRITICAL THINKING – FALL 2017

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The purpose of this assessment project was two-fold: to pilot innovative assessment approaches for The University of Texas System, Student Success Affinity Group on Assessment (part of the [Quantum Leaps](#) initiative) and to fulfill the university's responsibility to assess Texas Core Curriculum objectives for the Texas Higher Education Coordinating Board (THECB). We used the Critical Thinking VALUE Rubric from the Association of American Colleges and Universities (AAC&U) in an undergraduate research setting to assess *Critical Thinking*. One of the specific aims of the project was to test the alignment of the rubric with the format of a typical research poster. Hypothesizing that students who participate in undergraduate research attain above average *Critical Thinking* skills, the second specific aim was to measure their *Critical Thinking*.

Posters presented during The University of Texas at Arlington Undergraduate Research Showcase, October 17-20, 2017, were chosen as a convenience sample for this pilot project. Program participants from the Undergraduate Research Opportunity Program (UROP), Louis Stokes Alliances for Minority Participation (LSAMP), and the Undergraduate Research Assistant Program (UGRAP) formed the student sample. A team



of two raters, experienced in the use of the Critical Thinking VALUE Rubric, met at the poster showcase. Their first task was to discuss the rubric for calibration purposes by rating a poster together, to rate a poster independently, and to share the scores that each rater awarded for the five rubric dimensions. After adequate consensus was reached, rating commenced. Raters completed ratings on half of the available posters ($n = \sim 20$) for this pilot by walking through the exhibit with a clipboard in hand, reading the posters, and marking their scores for each dimension of the rubric. Rubric scores ranged from one to four, with higher scores indicating more *Critical Thinking*. The posters covered six academic disciplines: Nursing, Biology, Mathematics, Physics, Chemistry, and Computer Science Engineering. In addition, some posters in the sample explored intersections in disciplines (e.g., Nursing with Computer Science and Biology with Chemistry).

RESULTS

Analyses examined inter-rater agreement (*Fleiss Kappa*, see Table 1). Interclass correlation coefficients (ICC) indicated that for all five dimensions, agreement was excellent (*Range* = 0.79 to 0.94). Next, the scores from the two raters were averaged to obtain a mean score for each poster. As AAC&U considers a score of one as an indication that minimum benchmarks were met, these scores suggest that this sample of posters reflect higher than average *Critical Thinking* attainment.

Table 1 Analytics for Critical Thinking VALUE Rubric scores

| Dimensions | ICC | Mean | SD |
|----------------------|------|------|------|
| Explanation | 0.94 | 2.85 | 0.67 |
| Evidence | 0.92 | 2.40 | 0.74 |
| Influence of Context | 0.79 | 2.40 | 0.57 |
| Student Position | 0.86 | 2.40 | 0.57 |
| Conclusions | 0.83 | 2.60 | 0.78 |

DISCUSSION

Critical Thinking has been defined as “... a habit of mind characterized by the comprehensive exploration of issues, artifacts, and events before accepting or formulating an opinion or conclusion” (Rhodes, 2009). Typically, the presence of *Critical Thinking* is assumed in higher education research projects. In order to test that assumption, this pilot undertook the measurement of *Critical Thinking* in research posters prepared by undergraduates enrolled at UTA. Analyses suggest that the two specific aims for this pilot project were met: 1) the Critical Thinking VALUE Rubric aligned well with the poster content and the raters achieved excellent agreement in scoring with the rubric, and 2) as hypothesized, the students attained above average scores.

The current pilot has a few limitations, two of which were sample size of available posters and number of rater pairs. In addition, some students were only involved in research with a faculty mentor for a single semester. This scope was reflected in the content of the posters, particularly whether a full explanation of the project (background, method, results, discussion, and conclusions) could be attained. As such, some posters focused on the “research process” but could only report that results were forthcoming. The “research process” posters achieved lower scores for some dimensions of the rubric. The posters that described the full “research project” achieved higher scores than the “research process” posters for some dimensions of the rubric.

CONCLUSION

The Critical Thinking VALUE rubric aligned well with the content in poster presentations of research projects. This pilot supports the use of the rubric to observe and measure the presence of *Critical Thinking* in undergraduate research for the Quantum Leaps initiative that is studying innovative approaches (e.g., beyond simple retention and graduation rates) to measure student success. Future research should examine the construct validity of the five dimensions of the rubric to see how well they describe *Critical Thinking* because of its importance as a highly sought-after skill that hiring managers look for in college graduates seeking employment.

WORKS CITED

Rhodes, T. (2009). *Assessing outcomes and improving achievement: Tips and tools for using the rubrics*. Washington, DC: Association of American Colleges and Universities.