2018 Summer Assessment Institute: Numeracy

Overview

A faculty institute occurred in August 2018 to assess LCC's progress with student learning outcomes in the area of Numeracy. The institute consisted of eight faculty participants and a faculty coordinator. Participants were selected by the Vice President of Instruction following an open application process. Participants included **Trey Batey, Merry Bond, Jacquelyn Dailey, Klint Hull, Allison McCrady, Ryan Meagher, Stefan Rijnhart, and Adam Wolfer**. **Brad Benjamin** served as faculty coordinator.

Faculty contributed two hundred and thirty-nine assessable artifacts during the 2017-18 academic year from a variety of disciplines. Of the 239, 202 randomly selected artifacts were evaluated using a 5-point scale (using a rubric developed by LCC faculty and maintained by the Instructional Assessment Committee) on four associated outcomes. A minimum of two readers evaluated each artifact.

Results

Numeracy – *Achieve* competency with numbers and graphical skills to interpret and communicate quantifiable information, and apply mathematical and statistical skills in practical and abstract contexts.

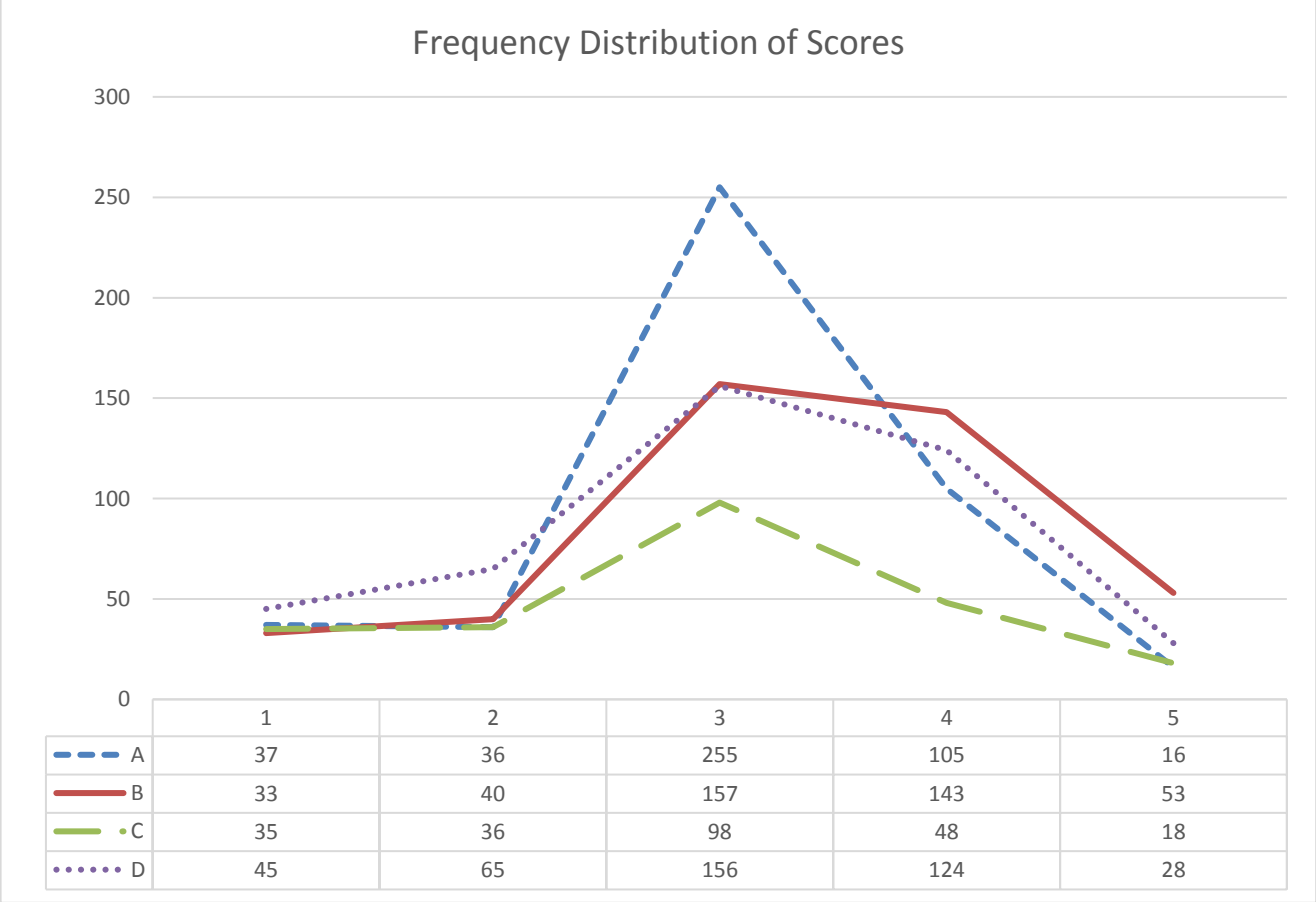
Outcome	Average
A) Students will analyze, interpret and draw inferences from graphical and numerical data.	3.1
B) Students will use quantitative skills to arrive at a solution/conclusion.	3.3
C) Students will use quantitative skills to assess the validity of a proposed solution/conclusion.	2.9
D) Students will communicate numerical and mathematical processes using appropriate symbols, language and terminology.	3.1
Overall	3.1

Inter-Rater Reliability

Inter-rater reliability was addressed in multiple ways. First, the institute began with an intensive norming (calibration) session during which faculty read and discussed artifacts to ensure that the rubric was being interpreted similarly by all participants. Next, score sheets were evaluated as they were completed in order to ensure that scores did not deviate by more than a point (for example, a 3 and a 4 would be considered an acceptable deviation). If scores deviated by more than a point (for example, a 2 and a 4) a third read was required. Scores were also monitored throughout to ensure that specific individuals were

not consistently scoring differently. Institute facilitators ensure that groups with patterns of deviation discuss their findings in small groups to improve calibration.

Outcome	Number of Completed Evaluations	Required Third Reads due to Scoring Deviation of more than one point
A) Students will analyze, interpret and draw inferences from graphical and numerical data.	199	15 (8%)
B) Students will use quantitative skills to arrive at a solution/conclusion.	190	19 (10%)
C) Students will use quantitative skills to assess the validity of a proposed solution/conclusion.	119	47 (40%)
D) Students will communicate numerical and mathematical processes using appropriate symbols, language and terminology.	181	20 (11%)
Overall		



	1	2	3	4	5
A	37	36	255	105	16
B	33	40	157	143	53
C	35	36	98	48	18
D	45	65	156	124	28

Observations

- The wording of the outcomes is somewhat unclear, causing confusion and leading to issues with inter-rater reliability, particularly with outcome 'C.'
- The word 'Numeracy' is outdated.
- The definition ("*Achieve* competency with numbers and graphical skills to interpret and communicate quantifiable information, and apply mathematical and statistical skills in practical and abstract contexts") is more clear than the outcomes themselves.
- Some readers thought it would be easier to assess one outcome at a time, with norming sessions conducted separately by outcome.
- While there was a sufficient volume of artifacts this year, the variety of disciplines was insufficient.
- On their own, the solicitation of artifacts through the Assessment Committee may not be sufficient to set the stage for a successful institute (although the method has typically resulted in a sufficient quantity of artifacts, the variety and quality are not always as expected).
- The number of third reads for Outcome 'C' was unacceptable.

Recommendations

- Replace the word 'Numeracy' with 'Quantitative Reasoning' or 'Quantitative Literacy."
- Revise or replace outcomes using examples from other colleges and/or the AAC&U VALUE rubric on Quantitative Literacy. Update indicators accordingly.
- In-service activities should be leading rather than following. In other words, the in-service activity should be about creating assessable artifacts for the coming institute, rather than a follow-up. In order to make this change, we will need to repeat Numeracy (Quantitative Reasoning/Literacy) in summer 2019 and adjust the rest of the schedule accordingly.
- Consider adding a prompt or prompts within the Curriculum & Program Review instrument about identifying assessable assignments for the summer institute process.
- Revisit the idea of requiring student portfolios as a graduation requirement (which would involve them selecting their own artifacts to satisfy the global skills).
- Provide resources for faculty on how to support students with math anxiety, keeping in mind that some faculty may struggle with similar feelings.

In-service Activity

- After a brief report out of findings from the institute from the coordinator, Brad, Trey and Merry will lead the faculty session. For the activity, faculty will form small interdisciplinary groups and will be asked to brainstorm an assignment that would result in an assessable artifact using either the LCC Numeracy rubric or the AAC&U VALUE Rubric for Quantitative Literacy. Following small group discussion, groups will be asked to report out on the rubric they chose and why. Remind faculty that the point of global skills is to identify the outcomes ALL students will have upon completion of a degree, not just students in STEM or other quantitative fields. Our assessment process should reflect that.