Executive Summary

During the Spring 2018 semester, the Drake Curriculum Analysis Committee (DCAC) reviewed the Quantitative Literacy (QL) Area of Inquiry (AOI) by analyzing student self-perceptions of academic engagement and perceived learning gains, and by initiating a faculty review of student work in the AOI. The QL AOI consists of the following three outcomes: (1) procedure (formal representation and reasoning), (2) strategy (strategic competence and analysis), and (3) synthesis (interpretation and evaluation).

Drake students report relatively high perception of skill level and engagement in general higher-order learning (e.g., application, evaluation, synthesis), but report lower perceptions of skill level and engagement when those concepts are applied to QL (e.g., strategic competence, analysis, application, evaluation, synthesis). On the 2013-17 Longitudinal Panel Study, students' perceptions of their abilities did not significantly change for quantitative understanding, with students initially scoring themselves relatively high on the pretest before their Drake experiences.

Faculty review of student work revealed general basic competence of learning outcomes. Reviewers noted that students either understood the basics (i.e., calculations), or did not. Faculty largely found that students could often get the right answer, but could not explain why or were unclear or vague when explaining why (lack of complexity). During the AOI workshop, faculty discussed:

- Working through the psychological aspects of math, namely student fear
    - Get students to practice the concepts
    - Encourage students to take risks
    - Help students understand the purpose and value to their major and their lives
- Changing the mindset of faculty teaching in this AOI
    - QL is more about critically thinking using quantitative concepts than pure data
    - QL is more than just symbolic thinking, but we ultimately give the most points for this and don't reward students as much for application and representational thinking
    - Encourage more low stakes, formative assessment to allow students to practice, take risks, and understand the "why" of the material more than the mechanics

To address these concerns, DCAC has developed the following recommendations.

For the Provost's Office:

1. Develop or obtain additional tools & strategies (pedagogy, assignment design, practice) that empowers faculty to help students with higher-order, complex learning

2. Create places and spaces for faculty to discuss teaching in this AOI

For the University Curriculum Committee (UCC):

3. Revise the AOI outcomes to focus on quantitative critical thinking over mechanics
4. Allow for more incorporation of low stakes, formative assessment of student learning when approving courses for the AOI

For Faculty:

5. Have intentional conversations amongst AOI faculty about:
    a. Higher-order learning in the QL AOI
    b. How to communicate to students why QL is important for their major, and their life
    c. Formative assessment of student learning that is low stakes and gives students the ability to practice and take risks
    d. Best practices in assignment design

Through assessment of several AOIs, DCAC has noticed the following as recurring themes:

1. Many students would benefit from developing greater higher order or complex thinking (e.g., integrative learning, analysis and application, consideration of alternatives or different perspectives)
    a. These are difficult competencies to teach
    b. Assignments may not explicitly ask for the demonstration of these competencies
    c. Additional resources, strategies and tools to promote this kind of thinking may be beneficial to faculty
2. Faculty need a "home base" for the AOIs they teach. They need places and spaces to discuss teaching in the AOI with people outside of their department, where they can share best practices, and challenges and opportunities