

About

Contextualization is a promising approach to improve math education by connecting math concepts to the workplace. This project extends prior advanced technological education targeted work in this area and focuses on:

- Faculty engagement with and professional development around math contextualization.
 - The impact of contextualization on students.
- In particular, special attention is paid to high-demand advanced technological education fields—including manufacturing, engineering, biotechnology, construction, and transportation.

Partnership

This project's success lies in strong partnerships. Researchers at UW-Madison are partnering with Madison College and Milwaukee Area Technical College, both large, comprehensive two-year colleges in Wisconsin.

- Madison College enrolls approximately 40,000 students, with 25% of the student body being racial/ethnic minority students. Madison College offers over 150 programs, approximately one-third advanced technological education-focused.
- Milwaukee Area Technical College enrolls about 40,000 students, the majority of which are racial/ethnic minorities. MATC offers over 200 programs, over 25% of them in advanced technological education fields.

Professional Development Model

Professional development consists of the following:

- A two-day workshop in partnership with Carnegie Math Pathways based on the Quantway curriculum development process.
- Follow-up webinars and support activities for creating contextualized lessons.
- A culminating session with review and introduction to the Community of Practice resources.
- A Community of Practice, a continuing forum for discussion and shared resources related to contextualization in math.

Guiding Questions

1. How do faculty teaching advanced technological education students math engage with and make sense of professional development activities as part of a community of practice around math contextualization?
2. How do faculty in the community of practice apply contextualization in teaching math?
3. What is the effect of math contextualization on students' interim and longer-term outcomes such as course grade, course completion rate, credential completion, transfer, and workforce participation, and how does contextualization exert its effect, if any?
4. How do advanced technological education students in math courses of varying levels of contextualization describe their learning experiences and motivational beliefs regarding math and their overall educational and career success?

Progress to Date

- Faculty at Madison College and Milwaukee Area Technical College are completing or have completed professional development activities.
- A community of practice is being established at each college.
- Survey faculty on their interactions and collaboration and analysis of the social networks they may be developing is underway.
- Interviews with faculty about their experiences with the professional development are underway. Initial findings indicate excitement around contextualization and the community of practice. Challenges identified include finding time, given teaching demands, to have opportunities for purposeful community building and creation of lesson plans and curricula.

Next Steps for Research

- Continue faculty interviews at Madison College and Milwaukee Area Technical College.
- Complete social network analysis and analyze faculty interview data. This method will allow us to investigate the strength of connections between each participant and the covariates we are interested in studying. These can be linked to students' academic performance in the future.
- Conduct classroom observations in various contextualized classrooms.
- Develop student survey to examine student experiences and track student administrative records.
- Conduct interviews with students to further explore their experiences with math contextualization.

For Further Information

For more information, contact Dr. Xueli Wang at xwang273@wisc.edu, or visit our website at <https://projects.ad.education.wisc.edu/c2l/>

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References available upon request

