



Western

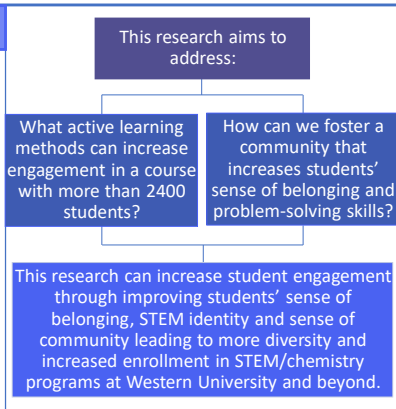
Enhancing Chemistry Education through Team-Based Active Learning Strategies

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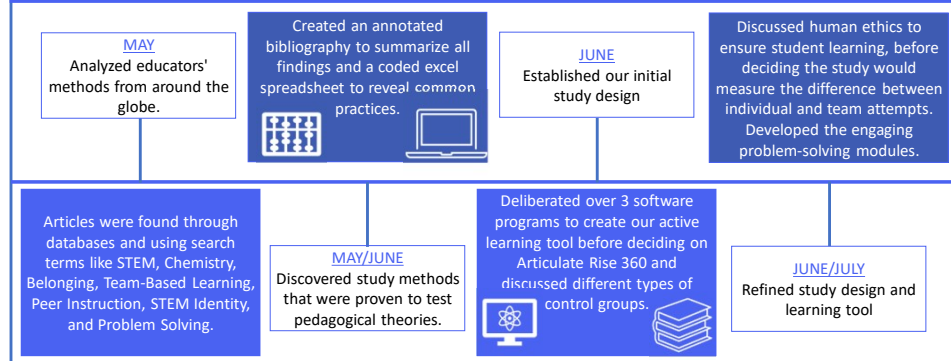
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Introduction:

- Over 100 programs at Western University require students to complete a general chemistry course, **CHEM 1302B**. But chemistry is a difficult subject for students and creating a supportive and encouraging learning environment is crucial for student success and continued interest in STEM fields (Su, R & Rounds J., 2015).
- Women are less likely to have a career in their STEM field and are more likely to drop out of STEM programs than men. Also most program changes occur in students' 1st year (Government of Canada, 2019).
- Underrepresented groups lose interest in STEM due to having a low STEM identity or feelings of not belonging (Kricorian, K, et al 2020).



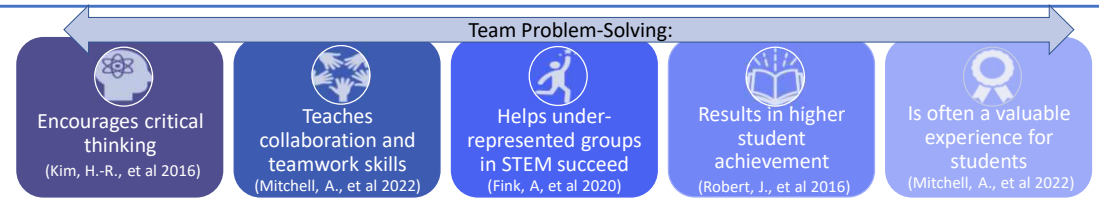
Methodology:



Results:

We developed team problem-solving activities to improve students' conceptual understanding while providing them with a community in CHEM 1302A/B.

"Students were attracted to the active and collaborative approach of TBL [Team-Based Learning]. They perceived the key advantages... [to be] an emphasis on basic science concepts, and immediate feedback."
(Burgess, A., et al. 2018)



Conclusions:

Study Design

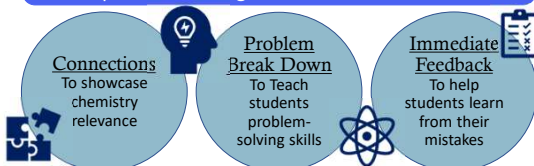
- Students will receive completion grades for the team-modules.
- Participants' module completion and test scores will be compared to their two survey responses:
- Survey 1 will create a baseline for the psychosocial factors (sense of belonging, STEM identity, etc.).
- Survey 2 will measure the impact that completing the activities in teams vs. individually had on the psychosocial factors.

Why this Design?

This design was chosen to ensure equal access to the learning tool and to keep participants data as anonymous as possible.

What We Created

To provoke peer-directed discussions, we created team problem-solving modules that included:



Team Problem-Solving Activities:

Diagram Questions are used to help students visualize what's actually happening with answer-specific feedback!

Connections to Real Life provide context for students with examples of how course concepts impact their lives.

Conceptual Questions ensure students know what happens microscopically and not just how to plug numbers into a calculator.

Matching Questions encourage discussions surrounding answer rationale to solidify theoretical concepts.

How will the following changes impact the equilibrium of a reaction?

Products are added into the reaction flask

Equilibrium will shift to the Left

Equilibrium will shift to the Right

References:

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