UNIVERSITY OF TORONTO
OISE | ONTARIO INSTITUTE
FOR STUDIES IN EDUCATION

**Code:** **Hawes**

**APD 1210 RESEARCH PRACTICUM COURSE**

**PROJECT DESCRIPTIONS 2025-26**

**FALL/WINTER**

**Name and Title:** *Zack Hawes (Assistant Professor)*

**Lab Website:** *https://www.mathematicalthinkinglab.com/*

***TITLE OF RESEARCH PROJECT:*** *The Role of Spatial Reasoning in Mathematics Curricula Around the Globe*

**NUMBER OF STUDENT PLACES AVAILABLE:** *1*

**PRIMARY MODE OF RESEARCH PLACEMENT PARTICIPATION (circle one option and describe):**

*___IN PERSON ___REMOTE (ONLINE) _X___HYBRID/FLEXIBLE*

*Please describe: The research for this project can be completed in person, remotely, or a combination of both. Ultimately, the decision where to work will be up to the successful candidate for this position.*

**OBJECTIVES AND METHODOLOGY:** *This research project will be in partnership with Dr. Katie Gilligan-Lee's Cognition, Development, and Learning Lab (https://www.gilliganleelab.com/). Together, our labs aim to better understand how spatial reasoning is instantiated in various Kindergarten-Grade 8 mathematics curricula in various countries around the world. This project is based on several bodies of research that suggests that greater curricular focus on spatial reasoning contributes to greater mathematics learning and performance. This study aims to test this claim through analyzing the degree to which spatial reasoning is emphasized in various mathematics curricula and how such differences relate to students' mathematics reasoning. Ultimately, this study aims to shed light on the role that spatial reasoning plays in mathematics learning, with potential implications for both educational policy and practice.*

**DESCRIPTION OF STUDENT PARTICIPATION:** *This project will involve roughly 8-10 hours of research/week and involve a combination of independent and collaborative work. Independent work will involve locating various country's mathematics curricula and using AI (e.g., ChatGPT) to code the curricula for instances of spatial reasoning. AI will also be used to translate curricula in different languages. Please note that no experience in using AI as an analytical tool is necessary. Once the curricula have been coded, we will work together to determine how to best analyze and visualize the data. Participation may also include writing up the report for conference presentations and peer-reviewed journal publications. Various skills are expected to be learned through participation in this*

*project, including learning how to use AI as an analytical tool, how to perform a curriculum content analysis, and insights into different mathematics curricula and approaches to mathematics learning around the globe.*

**DESCRIPTION OF PREFERRED SKILLS/BACKGROUND (OPTIONAL):** *The ideal candidate for this position will be someone who works well independently but also as part of a team, is open to and interested in learning to use AI as an analytical tool, and has a passion for mathematics teaching, learning, and cognition.*

**DAY AND TIMES OF LAB MEETINGS:** *Lab meetings will occur every two weeks (note these meetings will not be specific to this project but all of the lab's projects); project-specific whole-group meetings as well as one-to-one meetings will occur when the need arises (likely every 3-4 weeks).*