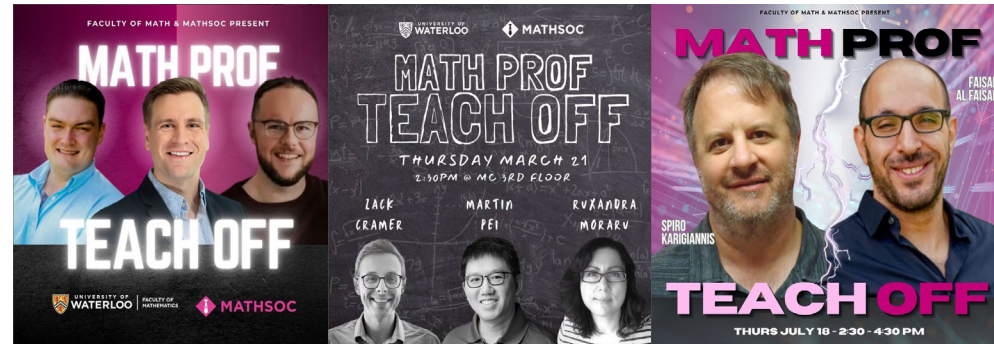


# Measuring Teaching Effectiveness by Student Learning Gains in a "Math Prof Teach-Off"

FYMSiC One-Day Conference

May 8, 2025

Diana Skrzydlo & David McKinnon



# What is a “Teach-Off”?

- Instructors get a topic (and pre-quiz) a week before the event and prepare a one-hour lecture
- Students arrive at the event and take pre-quiz
- Students are divided randomly into groups and attend the lecture by one instructor
- Students take post-quiz (similar but not identical)
- Everyone eats pizza while results are tabulated
- Winners are announced and prizes given out!



# Why?

- Measure teaching quality by student learning
- Show instructors outside their comfort zone
- Give students chance to see interesting math topics
- Showcase popular instructors (award-winners and many student requests!)



# Instructor Feedback – Preparation

- Treated like mini-course
- Learning material first, organized into logical chunks, tell a story
- Found interesting examples on internet
- Made sure to address pre-test questions
- Slides or board



# Instructor Feedback – Memorability

- Make things fun and build confidence, tell jokes
- Memorable visual aids including animations
- Relevant to student interests
- Play around with examples
- Relating to prior knowledge
- Discovery-based learning with tangible props
- Active learning (eat Oreos), Vevox questions, dance
- Mnemonics



# Instructor Feedback – Background

- Used to it from teaching first year
- Start from ground zero and include lots of examples
- Difficult without knowing what level to pitch it at
- Included essential background
- A major challenge!
- Live probing in class for understanding



# Instructor Feedback – Class Application

- Other way around, used similar techniques here as normally do in class
- Using time judiciously, selecting examples, activities
- More fun than a lecture
- Not really
- Forced to test own understand of why and how
- May use mnemonics more in classes



# Instructor Feedback – Final Thoughts

- Fun but lots of work
- Unconventional interactions between students and faculty build community
- Helpful to see instructors try something new – normalizes struggle
- Hard to teach meaningfully without context
- “Teach to the test” or not?





# Takeaways


- Students can learn a lot in an hour!
- Many similar techniques make effective lessons regardless of topic or format
- Try a pre-course and post-course quiz so students can see how much they have learned and grown
- Were the “winners” really the “best”? Pretty unscientific but this was just for fun
- But do consider evaluating student learning as a dimension of teaching effectiveness



Special thanks to: Jordan Hamilton, Nathaniel Stevens, Blake Madill, Zack Cramer, Martin Pei, Ruxandra Moraru, Spiro Karigiannis, Faisal Al-Faisal, Reza Ramezan, Dave Tompkins, Carmen Bruni, and Troy Vasiga

FACULTY OF MATH & MATHSOC PRESENT

# MATH PROF



# TEACH OFF


UNIVERSITY OF WATERLOO | FACULTY OF MATHEMATICS | MATHSOC

UNIVERSITY OF WATERLOO | MATHSOC

# MATH PROF TEACH OFF


THURSDAY MARCH 21  
2:30PM @ MC 3RD FLOOR

ZACK CRAMER      MARTIN PEI      RUXANDRA MORARU



FACULTY OF MATH & MATHSOC PRESENT

# MATH PROF



SPIRO KARIGIANNIS      FAISAL AL FAISAL

# TEACH OFF

THURS JULY 18 - 2:30 - 4:30 PM

# MATH PROF TEACH OFF

@ MC 3rd Floor (front of C&D)

November 25th, Monday  
3:00pm - 5:00 pm

See which professor is the best teacher!



Reza Ramezan      Diana Skrzydle      Nathaniel Stevens

UNIVERSITY OF WATERLOO | FACULTY OF MATHEMATICS | MATHSOC

MATHSOC

# Prof Teach-Off

Join us and enjoy free pizzas!



Dave Tompkins      Carmen Bruni      Troy Vasiga

MC 3rd floor, in front of CnD      January Friday 31st, 2:00pm - 4:00 pm

# Who's next? It could be you!

UNIVERSITY OF WATERLOO | FACULTY OF MATHEMATICS

