

The studio and the stadium

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Outline

- A little bit about me
- The stuff that makes teaching
- Where stuff goes
- The standard model at UBC
- The small class model at UBC
- Goals
- Outcomes

A little bit about me

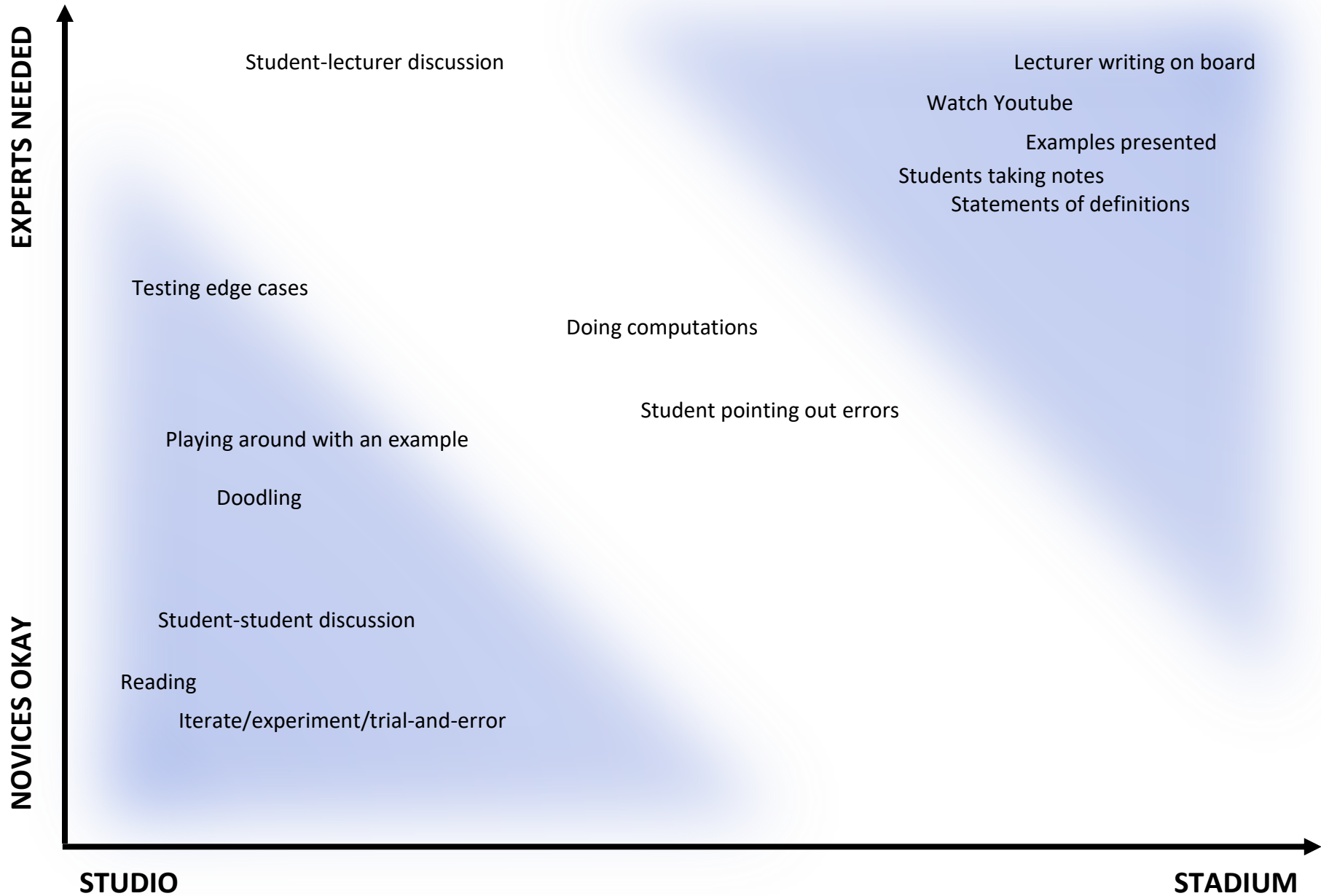
- Faculty member and Undergraduate Chair of UBC Math
- UBC: a public, research-oriented university in Vancouver, Canada with roughly 45000 undergraduates
- UBC Math: roughly 23000 enrollments in 130 courses, 70 faculty, 40 postdocs, 80 grad students

The stuff that makes teaching

Activity: *come up* with an answer to the following question, *condense* it to 1-3 words, and *write* it in the chat

- Question 1: What is a thing that you might observe happening in a “typical” math lecture?
- Question 2: What is a thing that you might observe happening when *you* learn math?
- Question 3: Think of a non-math thing that you learned or are learning – a language, breadmaking, how to taunt effectively in Dota 2. What is a thing that you might observe there?

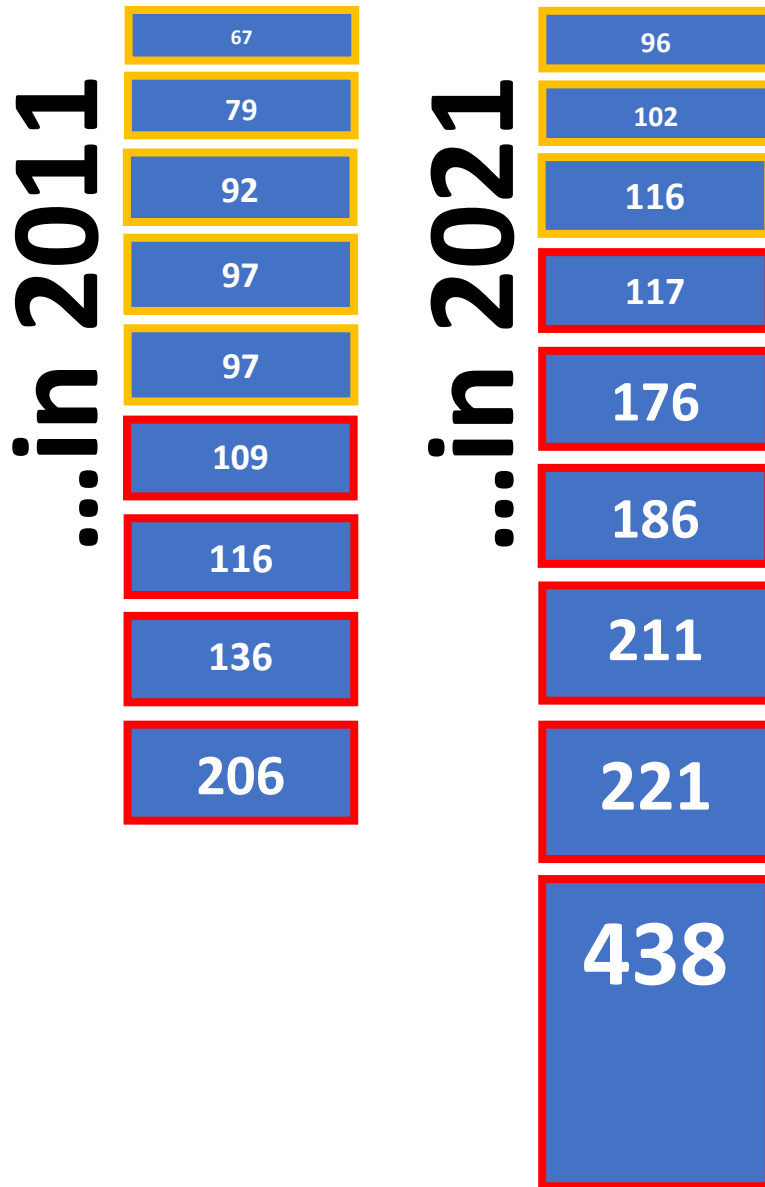
Where stuff goes



The standard model at UBC

- Enrollment in first-year calculus has jumped 50% in 10 years – from 3250 to 5000
- The number of available instructors has *not* jumped 50%
- All sections have gotten larger
- There are more faculty-taught sections
(due to a commitment to capping novice instructor section size)
- The novice instructor experience is still overwhelming

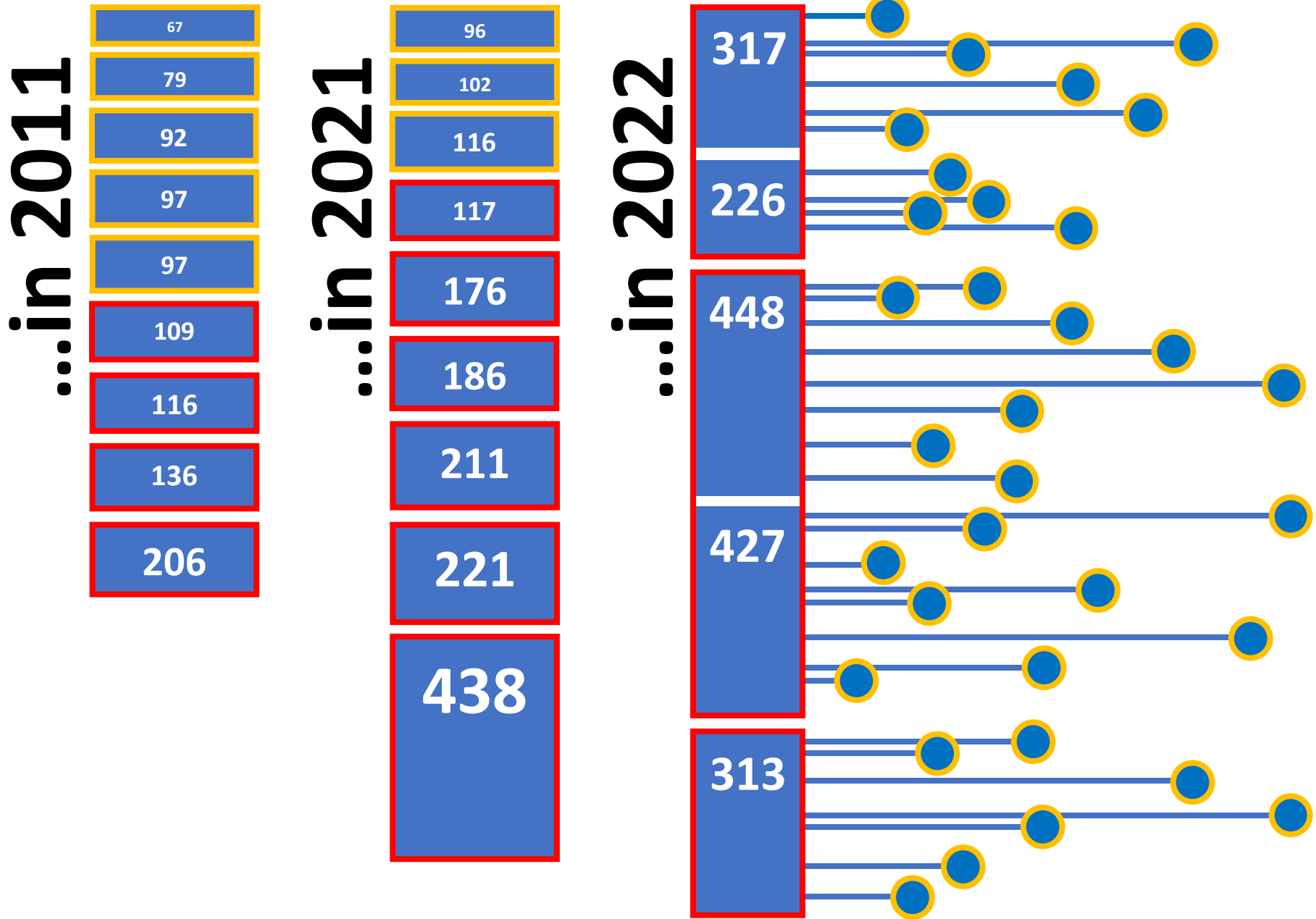
The standard model at UBC



The small class model at UBC

- bridges the stadium (lecture) and studio (homework) experiences
- 2-hour lecture and 1-hour *small class*
- 2-hour lectures
 - large (up to 480), faculty-taught
 - theory and canonical examples
 - a “view of the landscape”
 - new material (*e.g.* the Chain Rule)
 - 80% passive, 20% active
- 1-hour small classes
 - small (up to 60), novice-taught
 - active, group-based, problem-based
 - new material (*e.g.* related rates)
 - 20% passive, 80% active

The small class model at UBC



The small class model at UBC

- stadium: see www.math.ubc.ca/~fsl/olsumel.pdf
- small class: see www.math.ubc.ca/~fsl/olsumesc.pdf
- studio: see www.math.ubc.ca/~fsl/olsumehw.pdf

Goals

- For students
 - active and authentic learning, mainly in groups
 - close connection with an instructor and a TA
- For novice instructors
 - more structure, more support
- For experienced instructors
 - more teaching, less wrangling
- Overall
 - resource neutral
 - more stuff in its proper place

Outcomes

- This is in-progress
 - Published work (2019) indicates significant effects
 - in learning (common final exam scores)
 - in attitudes and perceptions (Math Attitudes and Perceptions Survey)
 - most pronounced in the top and bottom quartiles
- <https://www.tandfonline.com/doi/abs/10.1080/10511970.2019.1625472?journalCode=upri20>
- There are challenges
 - it is slow: what is covered may be “stickier”, but there is less of it
 - working in groups is hard – for both students and instructors
 - novice instructors connect much more, but experienced instructors connect less
 - Overall
 - it addresses an issue of resources
 - it is *principled*: students do what *looks like math*