ENGAGING EVERYONE CONTEXT, COMMUNICATION, CONNECTIONS AND COMMITMENT

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THESE ARE INTERESTING TIMES…

Things I have learned while sheltering at home with the "elderly"…

1. Don't cut your own bangs.
2. Instacart shoppers are my new best friends.
3. If you change your screen name during a zoom happy hour, remember to change it back before your next work-related meeting.
4. Hundreds of people are now quoting George Box, even if they don't know it…

   CNN: "All models are wrong, but some are useful" 10 times in one day!

   Fox News: "All models are wrong" 3 times in one day (they forgot the second part, but oh well)

AND WHEN I ASKED TEACHERS IN AN ASA ZOOM CHAT WHAT THEY HAD LEARNED…

- I don't have to collect paper ever again. (Beth Benzing)
- Students like to sleep in. They are much more alert in an afternoon zoom class or office hour than in my 9 a.m. in person class. Time to think again about a later school start time?? (Ruth Carver)
- Students miss working with each other. (Amy Hogan)
- Zoom can serve to equalize student contributions by giving each student the same "space". It can equalize things. (Jamie Perrett).
- It is really important to keep in contact with students and it is important to see their faces. (Vicki Lyons)
- Many students are more engaged in remote instruction than in face-to-face instruction. Many students feel more comfortable when they are in their own space. (Chris Franklin)

Engagement Rating Scale

WHAT DO WE MEAN BY ENGAGEMENT?

Definitions:

1. Occupy, attract or involve
   Participate or become involved in
2. To attract and hold fast
3. **To interest someone in something and keep them thinking about it**

ENGAGEMENT IS MULTIDIMENSIONAL

Several models in the literature, most identify between 2 and 5 dimensions.

Intellectual (cognitive) engagement

Engagement in the learning process
Perseverance, willingness to exert effort
Considering different ways to solve a problem
Interest and curiosity

Research supports the conclusion that there is a positive relationship between student intellectual engagement and student learning.

ENGAGEMENT IS MULTIDIMENSIONAL

Social and cultural engagement

Student/student interactions
Classroom environment that is welcoming and that makes students feel safe and valued. Creates a sense of belonging.
Learning is enjoyable/fun.

Relevance
Instruction that relates to students' life experiences, interests, and personal aspirations.

Research supports the conclusion that social and cultural engagement increases students' motivation to learn, as well as increasing knowledge acquisition and retention.

I KNOW THAT THERE ARE SOME WHO THINK…

… it is NOT my job

- to entertain students
- to make sure that students are having "fun"

So as a teacher of statistics, what is my job??

- ~~Tell students everything I know.~~
- Facilitate student learning.
- Research in stat and math education supports the conclusion that student learning and student achievement is related to engagement.

SO WHAT CAN WE DO TO FOSTER ENGAGEMENT?

- Context
- Connections
- Communication
- Commitment

AN IMPORTANT NOTE ABOUT ACTIVE LEARNING

Interaction with learning activities is important!

Learning is not a spectator sport.
(Which is probably why lecture is usually not the best teaching strategy. Even if you try to make it enjoyable. I can enjoy watching basketball, but I can't learn to play by watching!)

Incorporating well-designed learning activities is one way to foster both intellectual engagement and even social engagement (with the emphasis on well-designed!)

Many other sessions in this and past conferences address active learning pedagogies. For this reason, I have chosen to focus on other strategies. But don't interpret this as meaning it isn't important!

CONTEXT

Research in stat and math education supports the conclusion that student engagement is enhanced when learning occurs in a context that is relevant to students' lives or personal aspirations. Learning in a context that students find interesting or meaningful is then viewed as worthy of effort.

This contributes to both intellectual, social and cultural engagement.

STRATEGIES RELATED TO CONTEXT

Make it meaningful. Make it "work worth doing."

- Real rather than contrived contexts. Real data (or realistic data that lead to conclusions supported by real data). Current data.
- Choosing contexts that are relevant and have broad appeal, while avoiding contexts that might sensitive for some students and as a result actually disrupt learning (e.g. depression, immigration status), requires care and thought.
- Ask students what they are interested in. Pose multiple options for future examples.
- "Choose a path" types of HW problems. Several contexts/data sets with a questions posed for each. What students are asked to do from there is the same but they get to choose which question/context they pursue. This takes work, but some of the contexts would be used in multiple places in the course. Another example, this year's UCLA DataFest.
- Student written problem bank and challenge.

STRATEGIES RELATED TO CONTEXT--CONTINUED

Make it meaningful. Make it "work worth doing."

- When in doubt…animals, the environment, and themselves. Or other good examples can be found at ISLP's ProCivicStats (https://iase-web.org/islp/pcs/), TuvaLabs (https://tuvalabs.com/)
- Projects—but this shouldn't be the only strategy for making it meaningful for students!
- And just to provoke (George Cobb encouraged us to always do this. We miss you George.)—rethink content. With respect to context—if you can't find a current, meaningful, relevant example to illustrate a concept or method, should we still be teaching it??

CONNECTIONS

Research in stat and math education supports the conclusion that student learning is enhanced when students can relate what they are learning to prior knowledge, their own personal experiences, or their personal aspirations.

Research also supports the conclusion that integrating opportunities for social connections (student/faculty and student/student interaction) into the learning process both in and outside of the classroom can be beneficial in terms of student learning.

Both of these types of connections contribute to intellectual, social and cultural engagement.

STRATEGIES RELATED TO CONNECTIONS

Create opportunities for productive interaction.

- One example is the use of short focusing activities at beginning of class that foster productive interaction. Examples include giving a set of terms, graphs, or concepts and asking questions like
  - What is missing?
  - What doesn't belong
  - What do these things have in common?
  - What's wrong with this picture?
  - What's Going on With This Graph (https://www.nytimes.com/column/whats-going-on-in-this-graph). What do you notice? What do you wonder?

Activities like these can foster both intellectual and social engagement.

STRATEGIES RELATED TO CONNECTIONS--CONTINUED

Foster social/cultural engagement in your discussion of examples by asking questions like

- What surprised you?
- What did you find most interesting?
- Do you have any experience with this in your life?
- How do you see yourself using this?
- What is another situation where this method could be used to answer a question of interest?

Questions like these can promote both intellectual and social engagement.

COMMUNICATION

Good communication is essential for social engagement and can also be an effective tool for fostering intellectual and cultural engagement.

Communication is a two-way street.
(Maybe a three-way street)

Faculty  Student
Faculty  Student
Student  Student

We need to listen to our students!

STRATEGIES RELATED TO COMMUNICATION

Especially important to pay attention to this in large classes, and now online.

Provide opportunities for students to “talk statistics” and to reflect on what they are learning.

Provide opportunities for group work. Consider what role collaborative learning and/or service learning might play.

Ask questions that challenge and guide thinking. Low level, superficial questioning can cause interest to fade and deeper learning does not happen. Best advice, from Allan Rossman, is “Ask good questions.” See his remarkable (and engaging!) blog at https://askgoodquestions.blog/

Provoke conversations but in a friendly way (George Cobb, again).

COMMITMENT

We all know that students' commitment to take ownership of their learning is important.

But…

So is faculty commitment.

Motivate and challenge yourself to look for ways to engage with your students and their learning.

Teacher engagement creates student engagement (and vice versa).

What are you passionate about? Bring that into the "classroom." Passion and excitement can be contagious (which is good in this context!) When I talk about the ability to do this, I always think about Tom Short, who was a master at doing this. (We miss you Tom.)

LET'S BE HONEST--THERE ARE SOME CONS…

Some cons

- Greater faculty burden.
- Requires (a lot) more planning and preparation.
- Requires thinking carefully about and managing learning that is occurring outside the "classroom".
- Some implications for demand on class time.

But…

It is all in the service of student learning.

Which, after all, is our job!

IN CLOSING, CHECK THIS OUT…

"From the World of Math Ed"

Global Math Department Newsletter May 5, 2020

http://globalmathdepartment.org/newsletters/

Canada

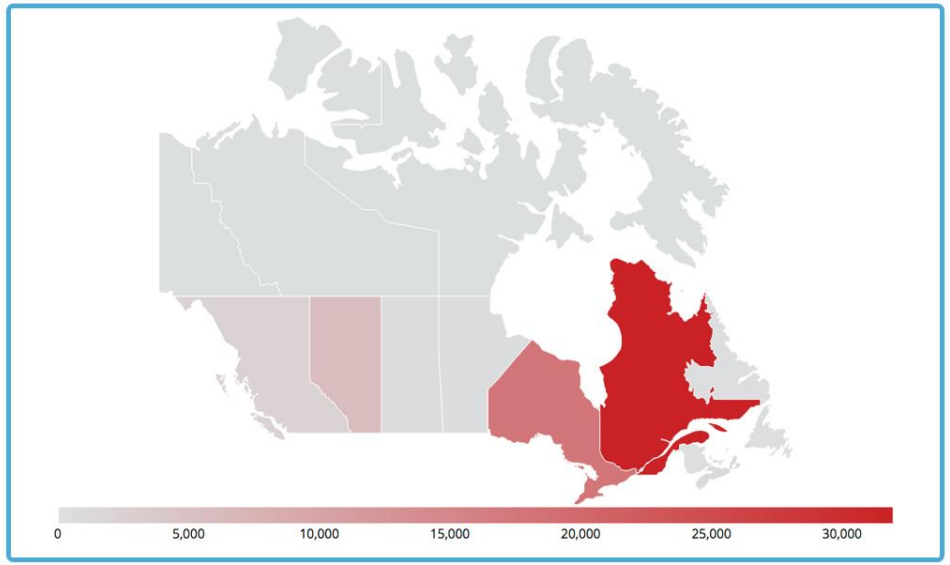
59,366

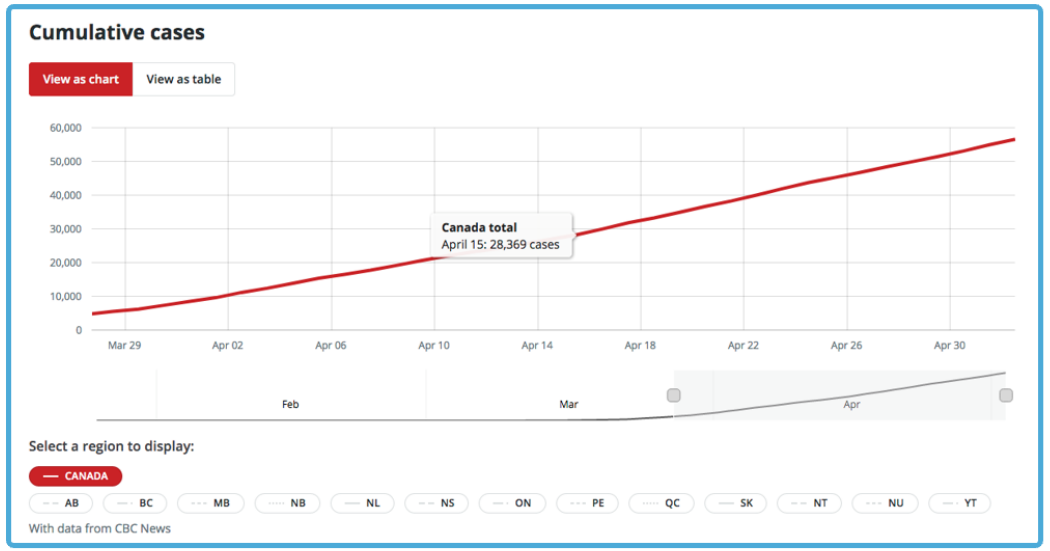
Total confirmed cases

Global

3,427,343

Total confirmed cases





"A reminder that we don't need to force learning because children (and grown-ups) will learn about things that interest them when they are ready." Hema Khodai

AS TEACHERS OF STATISTICS, WHAT IS OUR JOB?

We can't force learning, but we also can't sit back and just wait for students to learn.

We can't create student learning by just "telling" them everything we know. This is called "lecturing at the bored." And no, that is not a typo!

Our job is to create opportunities for student learning and the development of conceptual understanding for all students. And to be successful in this endeavor, we need to think carefully about

ENGAGING EVERYONE!

THANKS FOR ATTENDING THIS SESSION!

Enjoy the rest of eCOTS. There are many workshops and breakout sessions that I think will engage and provide lots of food for thought.

Stay safe and carry on!

QUESTIONS OR OTHER THOUGHTS?

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