Words Make A Difference: Intersectionality and Word Problems

Jennifer Ackerman
Hello!
What’s my identity?
What’s my identity?
What’s my identity?
What’s my identity?
What’s my identity?
What’s YOUR identity?

In the chat to everyone, type one or two things about your identity that you’re comfortable sharing

BUT

Don’t hit enter until I say “3-2-1 Go!”
I don’t have all the answers...

But it’s good to stop, consider, ponder, and share.
Poll Questions!
1. Context provides an important framework for helping students connect with mathematic concepts

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree
2. I include word problems on every unit/module assessment

A. Strongly Agree
B. Agree
C. Neutral
D. Disagree
E. Strongly Disagree
3. When it comes to assessments/tests:

A: I write all my own questions
B: I choose my own questions in a computer math program
C: I use standardized or a common assessment
D: Other
Conversion of units:

Convert 5 feet to meters
Reaction to Skill-based question:

* A) Perfectly fine question
* B) Ok, but could pick a better context
* C) I don’t mind this question, but I can see how someone else might
* D) What were they thinking?!
Jillian gave birth to a baby that weighs 7 lbs. She’s texting her mom in England and needs to send the baby’s weight in grams. How many grams does the baby weigh?
The baby weighs _______grams
Reaction to baby’s weight question:

- A) Perfectly fine question
- B) Ok, but could pick a better context
- C) I don’t mind this question, but I can see how someone else might
- D) What were they thinking?!
The border patrol seizes 6 lbs of an illegal substance at a check point. How many grams of the substance did they seize?

They seized _____ grams of the substance

**Actual test question option in the computer math program**
Reaction to border patrol question:

* A) Perfectly fine question
* B) Ok, but could pick a better context
* C) I don’t mind this question, but I can see how someone else might
* D) What were they thinking?!
Voting Theory:

The McKees’ Point Yacht Club Board of Directors wants to decide where to hold their fall business meeting. The choices are the Country Club (C), Frankie’s Fine Foods (F), West Oaks Golf Club (W), and Rosa’s Restaurant (R). The results of the election are shown in the preference table. Determine the winner using the pairwise comparison method.

(preference table not given :(
Reaction to Yacht Club Question:

* A) Perfectly fine question
* B) Ok, but could pick a better context
* C) I don’t mind this question, but I can see how someone else might
* D) What were they thinking?!
Basic Algebra:

The Iditarod sled dog race extends 1049 miles from Anchorage to Nome. If a musher is three times as far from Anchorage as from Nome, how many miles has the musher completed?

(Round to the nearest whole number.)
Reaction to Iditarod question:

- A) Perfectly fine question
- B) Ok, but could pick a better context
- C) I don’t mind this question, but I can see how someone else might
- D) What were they thinking?!
Analysis

How can a student focus on solving the problem if they have an emotional reaction to the context?

(amygdala/lizard brain!)
How do we prepare students for confusing language or poorly worded questions (three times as far from x than y)?
“Students want mathematics to be relevant. They want to see the connection to their worlds and how content will apply to their own lives in the future.”
So, what do our students look like?

What is Intersectionality?
Race/Ethnicity

Race is defined as a system based on observable physical characteristics.

Ethnicity is defined as cultural characteristics (language, food, clothing, dance, national origin).

For example:
Black is a racial group that includes the following ethnicities: Haitian, Jamaican, Nigerian, or African-American.

*descriptions provided by Leonard “Chip” Thomas
If you want to make it through, JUST BE YOURSELF!

**Intersectionality**

This is Bob. Hi!

Sad people do not like Bob. Bob faces oppression for being a triangle, for having stripes.

Luckily, there are liberation groups, but they aren't intersectional. So they look like this:

- They don't talk to each other.
- They compete.
- Bob can't work out where to go.
- "Of am i more stripe or triangles?"

Bob wishes that the triangles and stripes could work together.

Oppressions are not isolated. Intersectionality now!
“The interconnected nature of social categorizations such as race, class, and gender, regarded as creating overlapping and interdependent systems of discrimination or disadvantage; a theoretical approach based on such a premise”

Oxford English Dictionary, 2015

https://www.cjr.org/language_corner/intersectionality.php
Intersectionality is more about looking at how two or more of the sociological categories affect a person:

- Black students are less likely to succeed in college.
- Black male students are even less likely to succeed.
- Black male students living below the poverty line are less likely than that.
- Transgender black students living below the poverty line are least likely, etc.
Expanding this Idea

Gender non-conforming Pronouns
One Day at a Time
On Netflix
Season 2, Episode 3
First ~3 minutes
The whole is greater than the sum of its parts...

A classroom should be inclusive and welcoming for every student (inclusivity) with consideration for all of their various backgrounds (intersectionality)
What do your students look like?
Jefferson’s Fast Facts

* 12,259 Students Enrolled
* 76% Credential Seeking Fr & So
* 18% High School / Dual Credit
* 6% Non-credential Seeking
* 34% Full-time; 66% Part-time
* 2305 First-time Freshman
* Average Age = 27
* 31.8% Underrepresented Minorities
* 55% Female; 41% Male; 4% Unknown
* 53% First-generation
* 66% Pell Grant Eligible
* 80+ Countries represented in student body

Fall 2017
Should you include difficult or sensitive topics to provide context in your classes?

Issues around black lives matter
Graphs of covid 19 growth
Gender identity
Financial loss/markets
Low hanging fruit...

Statistics

Questions with gender:
- Binomial variable
- Multiple Gender categories
- Topic avoidance

<table>
<thead>
<tr>
<th>Examples for Statistical Data Collection:</th>
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<tbody>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Other</td>
</tr>
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</table>
Normalize unfamiliar content
Model respect for differences

- Subsequent question if necessary:
  For those who answer male/female,
  Do you identify as:
  - Cisgender
  - Transgender
  - Prefer not to Disclose

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<thead>
<tr>
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<th>Dates Back to</th>
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<td>Hijra</td>
<td>400 BC</td>
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<td>Mexico</td>
<td>Muxes</td>
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<td>Aboriginal Austrailia</td>
<td>Sistergirls, Brotherboys</td>
<td>Pre-Colonialisation</td>
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<td>First Nations People</td>
<td>Two-Spirit</td>
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<td>Samoa</td>
<td>Fa’Afafine</td>
<td>Pre-Christianisation</td>
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<td>Indonesia</td>
<td>Waria</td>
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</table>
Expanding ideas and mindsets

* Model compassion for multiple points of view
* Pro-actively talk about being respectful of other students’ viewpoints and differences of opinions
* Gently suggest different ways of looking at a situation
* Provide additional resources if possible/when appropriate
* Use exploratory learning opportunities to allow students to discover new ideas rather than being lectured about a topic
Word problems, revisited!

Relevant, relatable, reasonable...
A chemistry teacher has 740 g of a substance and he wants to separate the substance into 3-oz jars. How many 3-oz jars can he completely fill?
Now you try it!

* Come up with a conversion question
  - What context will you use?
  - How relevant is it to students?
  - Is it a higher-order question or a mechanical computation?
SHARE TIME!
Examples to consider – What cultural context makes sense?

Which of the following are continuous functions? (Select all that apply.)

- The temperature at a specific location as a function of time.
- The temperature at a specific time as a function of the distance due west from New York City.
- The altitude above sea level as a function of the distance due west from New York City.
- The cost of a taxi ride as a function of the distance traveled.
- The current in the circuit for the lights in a room as a function of time.
- None of these.
There were 7,692 single-bias hate crime offenses reported in the United States in 2010. These crimes were divided into categories, with the following breakdown: 3723 were based on racial bias, 1,410 on religious bias, 1475 on sexual orientation bias, 1,039 on ethnic bias, and 45 on bias against those with disabilities.
* Make a frequency distribution for this data
* Use the frequency distribution to find the probability that a hate crime was motivated by sexual orientation bias.
* Use the frequency distribution to find the probability that a hate crime was motivated by bias against race or ethnicity.
* Use the frequency distribution to find the probability that a hate crime was not motivated by bias against religion or those with disabilities.
The English department is voting on a new department chairperson. The three candidates are Professor Greene (G), Professor Williams (W), and Professor Donovan (D). The results of the election are shown in the preference table. Determine the winner using the pairwise comparison voting method.

(preference table not given :)

Neutral example:
Raising awareness through context and thoughtful questions is a powerful tool and is at the very heart of I³.
AMATYC Equity Committee

* Resources and Articles:
  - Dafina-Lazarus Stewart: Language of Appeasement
  - FORBES: New Research: Diversity + Inclusion = Better Decision Making At Work
  - HBR: Why Diverse Teams Are Smarter
Join the AMATYC community to improve equity in mathematics education.

Want to get involved? Here’s how!

Contact committee chair:
AJ Stachelek
equityinmathed@gmail.com
July's Spotlight on IMPACT
Click here to join the conversation focused on Equity
Sponsored by AMATYC’s Equity Committee
Hosted by Jennifer Ackerman, Helen Burn, Lucy Michal, Micah Miller, Nancy Rivers, & AJ Stachelek

Equity Practices that Enhance Mathematics Learning: From In-Person to Virtual/Online Classes

This month, we focus on practices across the four IMPACT pillars that (1) lead to equitable mathematics access and attainment and (2) can be implemented at key points throughout the term in any mathematics learning environment including online/virtual courses.

Each month a topic from IMPACT is highlighted on the IMPACT Live! Community on my.amatyc.org.
The new content includes:

- a blog on IMPACTful Thoughts
- weekly discussion posts on IMPACT in Action
- research and information on IMPACT Plus

Coming in August—Standards

JOIN US at my.amatyc.org
THANK YOU!

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