Humanizing Online Mathematics Teaching

Possibilities and Resistance

Mary Candace Raygoza, Ph.D.
Assistant Professor, of Teacher Education
Saint Mary’s College of CA

Kelsey Macias, MA
Mathematics Teacher, Dublin High School &
Adjunct Professor, Saint Mary’s College of CA

Nima Harirchian
Mathematics Teacher, Berkeley High School
The mission of TODOS: Mathematics for ALL is to advocate for equity and high quality mathematics education for all students— in particular, Latina/o students.
Introductions

Mary Candace Raygoza
she/her/hers

Kelsey Macias
she/her/hers

Nima Harirchian
he/him/his

Mary Candace Raygoza
she/her/hers

Dedicated to our colleague and professor, Dr. Gemma Niermann
1950-2020
Consider: How can you incorporate mindful math moments with your students?
Paulo Freire *Pedagogy of the Oppressed* (1970): Process of *becoming* more fully human, never-ending process of struggle against oppression

Lisa Kelly (2020): We are not online teaching; we are *REECHing* (Remote Emergency Education for Community Health)

Imani Goffney and Rochelle Gutierrez (2018) *Rehumanizing mathematics* for Black, Indigenous, and Latinx students—honoring that humans have been practicing mathematics for centuries in ways that are humane
Be an advocate for access

- Technology
- Basic human needs
  - Food, shelter, safe space, clean clothes, school supplies
- Organized communication with families

Communicate safely with students & parents.
Build and sustain beloved mathematics classroom community

1. Online math class norms
2. Community builders for collective math power
3. Math autobiographies and storytelling
4. Temperature checks, in relation to and beyond the math
### Build and sustain beloved mathematics classroom community

1. **Online math classroom norms**

<table>
<thead>
<tr>
<th>Norms &gt; Rules</th>
<th>Co-create!</th>
<th>Display!</th>
<th>Reflect &amp; Process Check</th>
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</thead>
<tbody>
<tr>
<td>Keep your mind and heart where your feet are. Be present. That said, our families and family needs are not distractions.</td>
<td>Demand of yourself openness of mind and heart. Be comfortable with being uncomfortable. You also have a right to pass.</td>
<td>Listen deeply to each other’s mathematical ideas in the virtual room.</td>
<td>Encourage, ask a question, or share an idea; but don’t just share answers.</td>
</tr>
<tr>
<td>Mathematical dialogue and debate is wonderful. No one’s humanity is up for debate.</td>
<td>Make space, take space. Take turns!</td>
<td>Ask critical questions, of math and the world, and share your “why.”</td>
<td>We (do our best to) start on time and end on time.</td>
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<tr>
<td>Try not to interrupt, but if you do, apologize. Mute your mic when not speaking.</td>
<td>Everyone is a mathematician. Confusion and uncertainty is expected doing mathematics</td>
<td>Use personal pronouns and gender-conscious language. You may “re-name “yourself to include pronouns.</td>
<td>We expect your full and safe participation in our online sessions.</td>
</tr>
</tbody>
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2. Community builders for collective math power

Build and sustain beloved mathematics classroom community

Chat a mathy icebreaker

Show and share about an object that represents your journey as a math student (mathematical storytelling)

3 variables about yourself (algebra)

An important number in your life and why it means a lot to you (numeracy)

Concentric Circles: Students discuss get-to-know-you prompt in pairs, then broaden prompts as you combine groups again and again until class is discussing all together (geometry)

Community Resource Mapping: Create and share a map of community assets (geometry)
3. Math autobiographies & storytelling

- Math autobiography assignment
- Invite storytelling of students’ math experiences in spring semester, math in their lives this summer, and the math in the world they wonder about right now (numbers, relationships, representations, etc.)
- Check out this Woke Math blogpost on telling stories in math class

Consider: What parts of your math journey will you share with students?
Build and sustain beloved mathematics classroom community

4. Temperature checks

- A high and a low
- A rose and a thorn
- Represent your week in an emoji or hashtag
- Share how you are doing in the form of a weather pattern
- What is one joyful practice that is energizing you (as a student or human in the world)?
- What is on your mind most in this time?
- What support do you need, and do you have what you need to get it?
“Healing centered engagement offers an important departure from solely viewing young people through the lens of harm and focuses on asset driven strategies that highlight possibilities for well-being.”

Shawn A. Ginwright
Mathematizing Emotions

Webinars & Training

Webinars

Whether you’re a new or frequent Desmos user, we have webinars that can support your development. Sign up for an upcoming webinar or view one of the recordings.

Self-Paced Learning

Check out our bank of short tutorials, which can help you learn beginning, intermediate, and advanced Desmos tools.
Humanizing Essential Questions, Assessments, & Activities in Math

Essential Questions
- How can you take multiple steps to solve problems in our communities?
- How do mathematical relationships tell stories?
- How can using mathematics make solving problems easier?
- Why and how are graphs useful?
- How do we represent and predict growth?
- Where does mathematics live in nature?
- What is the relationship between mathematics and antiracism?

Assessments
- Digital portfolios: How can they capture transfer of understanding? Of my students empowering themselves as mathematicians?
- Focus on the metacognitive: Know-Want to Know-Learned charts, Exit Tickets, Self and group reflections

Activities - Mix it up!
- Quick write
- Number Talk / Math Talk
- Poll
- Digital collaborative whiteboard
- Digital interactive notebooks
- Quizzes: Quizizz and Kahoot
- Pair share in breakout rooms
- Group work in breakout rooms
- Digital gallery walk
- Jigsaw
- Graphic organizer
- Flip the classroom with asynchronous interactive pre-recorded video viewing

Check out the Decolonize Your Curriculum FB Page for more ideas
Be present with students and mathematics

- Connect with students and families
  - Aspirational, Linguistic, Familial, Social, Navigational, Resistant capital (Yosso, 2005)
- Consistency/normalcy - routine warm-ups, check-ins, themes throughout the week
- Technology resources/tools
  - Edpuzzle, Desmos, Flipgrid, etc
Humanizing Math Tech Tools: Google Classroom

- Home Base for assignments
- Google Sites also a good option
- Counselor Information
- Parent Information

How to create a virtual bitmoji scene in google classroom

Ashley Guerrero bit.ly/agvirtualmuseum
Humanizing Math Tech Tools: Edulastic
Humanizing Math Tech Tools: GoFormative

- Standards Based Question Bank
- Opportunity for student uploads of work
- “Scribble” option for students to show work
- IMMEDIATE LIVE intervention with students via text box within a student’s assignment while they are working on the assignment
Humanizing Math Tech Tools: FlipGrid

FlipGrid Tutorial

Getting Started with Flipgrid for Remote Learning | Saturday, July 11, 2020, 10:00 AM CT (16:00 DST) Join the live broadcast on Youtube or on Facebook.

Getting Started - Coaches/Specialists | Thursday, July 16, 2020, 10:00 AM CT (16:00 DST) Click this link to join at the time listed!

Getting Started with Flipgrid | Monday, July 20, 2020, 11:00 AM CT (17:00 DST) Click this link to join at the time listed!

Educator Innovation Week | July 27 - July 31… details coming soon!
Humanizing Math Tech Tools: Desmos

Pandemic - I notice, I wonder
Humanizing Math Tech Tools: EdPuzzle

6.2 Finding nth roots
Kathy Ingham

Try to solve this example. Refer to the rule we just went over.
Don’t expect yourself to learn every awesome math tech tool or trick this year.

Do the best you can. Use what you have, and be creative. And share your ideas!
Teaching about the social and political world in math class

Eva Thanheiser
Professor of Mathematics Education at Portland State University

Numeracy in the time of Covid-19 – #1

or Why we need to teach math to make sense of the world.

Numeracy “the ability to understand and work with numbers”

GOOGLE THE TERMS.

Numeracy is essential to understand the world around us. However, unfortunately numeracy is not always a goal in mathematics education. Often the focus is on what algorithms to apply and when rather than to make sense of a situation. This leads to many adults who are not thinking quantitatively when participating in their world.

COVID-19, Exponential Growth, and the Power of Showing Up in Social Solidarity:

The Math Behind the Virus

Talk by Dr. Mary Caroline Maguire, Assistant Professor of Mathematics, San Jose State University

Mathematical Questions: Making Sense of the Graph

1. Looking at the graph:
   a. What do you notice?
   b. What do you wonder?
2. What does the meaning of “x” days on the x-axis?
3. What does the meaning of “y” values on the y-axis?
4. At 40 days, how many cases of COVID-19 would be expected if one case was avverted? How does this compare with how many cases of COVID-19 would be expected if one case was avverted in 7 days?
5. At 80 days, how many cases of COVID-19 would be expected if one case was avverted? How does this compare with how many cases of COVID-19 would be expected if one case was avverted in 7 days?
6. How are the functions represented in this graph similar and different?
7. What conclusions do you draw from analyzing the graph?

Public Health and Humanity Questions

1. Why does social distancing matter during a viral pandemic?
2. What barriers exist for people to participate in social distancing?
3. What resources (e.g., locations to access food, neighborhood support, work leave policies in our community) can families access that challenge those barriers? How can we share about them with one another?
Acknowledging the Divide between SEL and Social Justice Mathematics

How do I bridge these ideas together to help prevent more trauma in my classroom as we tackle difficult social justice topics?
Where Healing, Social Justice, and Trauma-Informed Care Overlap

- Temperature Checks
- Mindfulness (MLP)
- Practice without judgement
- Self-Regulation Techniques
- Building A Beloved Classroom (Raygoza)
- Community Building/Research
- Ecology - how we relate to each other and our physical surroundings

- Social Justice Curricular Ideas (Kari Kokka)
- Teaching About the Social and Political World - Resource Slide
- Development of “students’ sociopolitical consciousness, or conscientização” (Friere, 1970).
- Observations of geo-political surroundings

**Culturally Responsive Pedagogy**
- Radical Healing & Healing Justice (CARMA) - Shawn Ginwright
- Positive Cultural and social identities (Gutstein, 2006)

“Analysis of structural conditions that impact well-being is important to prevent youth from blaming themselves for their own social emotional states (Ginwright, 2016; McGee & Stovall, 2015).”

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**Figure 1.** Theoretical framework for Healing-Informed Social Justice Mathematics. Note: Concepts of radical healing represented by the CARMA acronym are listed in bold letters.

Resistance with Purpose

Resistance is not just saying NO, but directing the narrative of how Math Education is implemented and how we as a greater community work together.

Identifying your Community’s Wants/Needs

School..................What are the students interested in?
Colleagues..............Bring 1 other person to collab with.
Parents......................Parent Liaison/Coordinator
District Administrators............Begin the conversation

MTBoS - Math Twitter Blog o Sphere
Equity and Social Justice in Math Ed Twitter Follow List
Resistance with Purpose

RESIST

Standardized & High Stakes Assessment

Top-Down Decisions

Racial Inequities & Systemic Oppression

Suspension Rates

EMBRACE

Inquiry and Mathematical Practices
Social Justice Mathematics and Science Curricular Resources for K-12 Teachers

Student Councils with Site Council
Youth-led Participatory Action Research - in math articles by Raygoza, Terry, and Yang.

Promoting Students’ Sociopolitical Consciousness and Well-Being in Math Class

Restorative Practices - Candice Rose Valenzuela
Engage in self and collective math teacher care

Surrender

Self-Compassion

Resistance: Action & Activism
Humanizing Online Math Teaching “Syllabus”
AKA References

bit.ly/HumanizingOnlineMathTeachingSyllabus
Thank you & Questions

Mary Raygoza - mcr13@stmarys-ca.edu
@MaryCRaygoza

Kelsey Macias - kri1@stmarys-ca.edu
@MrsMaciasMath

Nima Harirchian - nima.harirchian@gmail.com
@nima_harirchian