

Developing Antiracist Scenario-Based Mathematics

Assessments

Dr. Jennifer Randall and Maria Hamdani Marcela Billingslea and Selina Ma

ABSTRACT

The erasure and marginalization of racially and ethnically minoritized populations (and the devastating effects) in K–12 educational curriculum and assessment has been well-established (Randall, 2021). With this project, we investigated the extent to which a justice-oriented approach to assessment development can serve as a promising strategy for mitigating these negative impacts. By asking the question: What would an assessment that centered the experiences and needs of Black, Brown, and Indigenous students look like? This project was two-fold. First, working with mathematics and assessment experts, we developed justice-oriented mathematics assessment items using the following criteria created by Dr. Randall:

- Explicitly disrupts conventional negative stereotypes as they relate to any marginalized group • Highlights oppressive sociopolitical inequalities and injustices while empowering students to enact change
- Provide a complete and accurate historical and contemporary perspective that goes beyond celebrating/or protecting whiteness that are not centered in whiteness and the white supremacist hegemony
- Allows for multiple ways of knowing/understanding and performing the content Second, we provided ChatGPT with specific scenarios and asked it to create additional assessment items based on those scenarios. Data were collected through interviews with students, teachers, and item writers. The current results have led us to conclude that justice-oriented assessments are engaging and support students from marginalized communities in feeling valued, affirmed, and empowered to enact change.

OBJECTIVES

- 1. To investigate the effect of justice-oriented approach to assessment development.
- 2. To develop justice-oriented mathematics assessment items using the four criteria for antiracist assessment created by Dr. Randall
- 3. To investigate the efficacy and utility of these justice-oriented assessment items and the item writing process by collecting data through interviews with students, teachers, and item writers.
- 4. To determine whether justice-oriented assessments are engaging and support students from marginalized communities in feeling valued, affirmed, and empowered to enact change.

METHODS

What would an assessment that centered the experiences and needs of Black, Brown, and Indigenous students look like?

Create Items Investigate traditions, food, language, holidays and historical and current events. Utilize information to create culturally responsive and antiracist scenarios.

Verify Items Show items to stakeholders from minoritized communities





Engage student focus groups by asking prompts related to cultural identity, assets, student engagement, rigor and empowerment.

Identities Represented

- Race/Ethnicity: Indigenous, Asian, Black, Hispanic or Latino, Pacific Islander, White
- Gender: She/Her, He/Him, They/Them, She & He, She & They, He & They • LGTBQ+
- Disabilities
- Elderly

Using Chat GPT

M Write a math question for grade 6 that aligns to common core standards with the following Native Americans have lost nearly all of the land they historically occupied. Tribes that still have land today were forced into less valuable areas where they have not been able to benefit from key parts of the economy. Modern Native American lands are also at increased risk from climate change dangers like extreme heat and reduced rain.

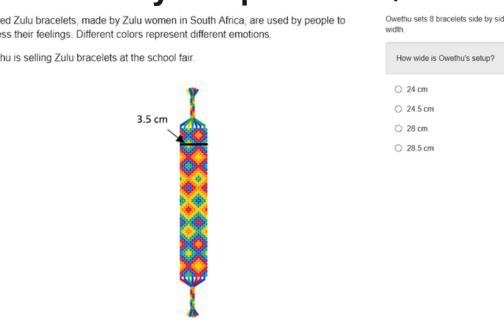
A historian discovered that approximately 1.5 billion acres has been stolen from Native Americans, which is about 99% of the land they historically occupied.

The Native American tribe in the present day has a land area of 10,000 acres. If the tribe wants to set aside 20% of their land for wildlife conservation, how many acres will be set aside for this purpose?

This question aligns with the Common Core Standard 6.RP.A.3c which requires students to solve ratio and percent problems using proportional relationships. It also relates to the reallife scenario given in the problem, which encourages students to connect mathematical

ASSESSMENT QUESTIONS

Culturally Responsive Question Grade 5



Antiracist Question Grade 5

the United States, migrant workers help grow the economy by working needed jobs, buying

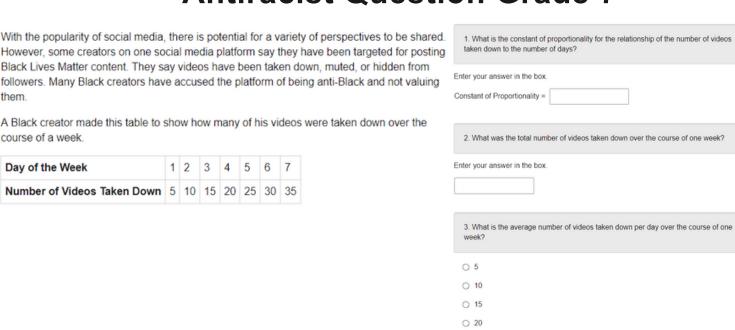
1. How far do the migrant workers travel in all? Pennsylvania. When the apple season is over, they travel 1,021.42 miles to an orange grove in Florida. Then they travel 727.9 miles to a blueberry farm in North Carolina



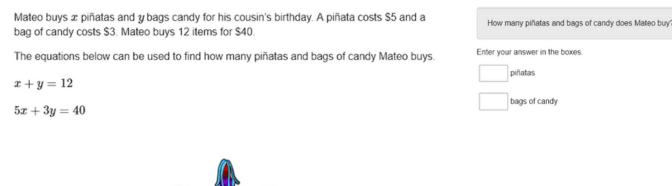
Culturally Responsive Question Grade 7

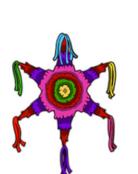


Antiracist Question Grade 7

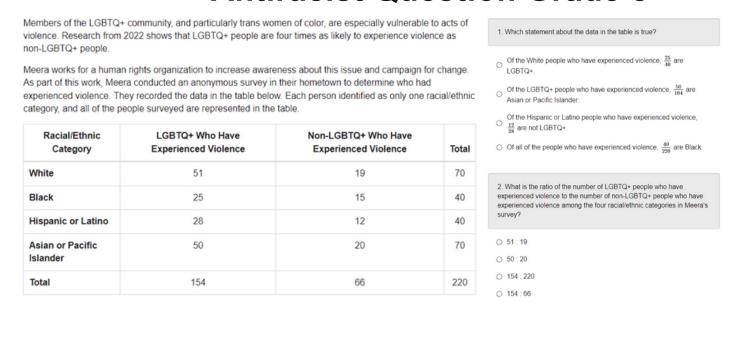


Culturally Responsive Question Grade 8





Antiracist Question Grade 8



FINDINGS

What Students Want: Stories of Empowerment



"I was thinking maybe just bring up Black people who have succeeded. You hear about how horribly White people treated us for majority of our time in America, we could have stories about people who did well in an economy that was not meant for them, wasn't working towards them and strive to be better than most, even if they were Black."



"We should hear more stories about black people taking that pain and turning it into power."

The Process of Creating The Questions - Interviews With Writers

How does your sociocultural identity impact the way you approach the item writing process?



What do you do to ensure that the content and language used in items do NOT privilege a particular cultural or linguistic perspective?



How Students Responded To Culture in Items

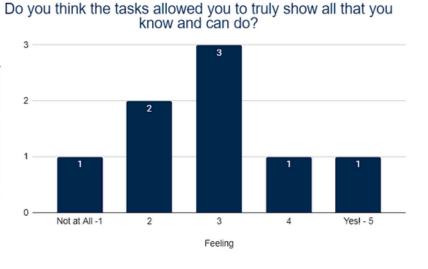


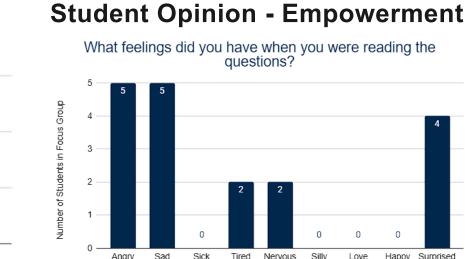
"I feel like every time they talk about Black people, they talk about slaves.'



"I have seen a lot of black creators being silenced on social media platforms, and I have also seen white creators stealing content that was originally made by black creators, but their videos still stays up."

Student Opinion - Rigor







SELECTED REFERENCES

• Justice-oriented assessments are engaging and support students from marginalized communities in feeling valued, affirmed, and empowered to enact change.

CONCLUSIONS

- Antiracist math assessments help students formulate their own conclusions through evoking emotions as seen on figure "Student Opinion - Empowerment".
- Culturally responsive math assessments make students feel seen as on figures above.
- Justice-oriented assessments are beneficial to all students regardless of their identity.
- Justice-oriented assessments are the future for a more diverse, equitable and inclusive education.
- Randall, J. (2021, May). The Road to Assessment Hell is Paved with Color-Blind Intentions: Moving Towards Justice-Oriented Antiracist Assessment. Assessment for Learning Conference.
- Randall, J. (2021). "Color-Neutral" is Not a Thing: Redefining Construct Definition and Representation Through a Justice-Oriented Critical

PARTNERSHIPS





