Marginalized Students' Exposure to Inclusive Pedagogy

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Background

- Students from marginalized communities earn bachelor's degrees at lower rates in STEM (science, technology, engineering, mathematics) careers than members from non-marginalized communities[1].
- The following variables have been known for predicting STEM career aspirations [2]:

familial support | school influence | career self-efficacy

- Marginalized students receive less exposure to inclusive practices that promote STEM interest because of education systems that perpetuate racist ideologies that promote [2]:

housing segregation | under-resourced schools | unqualified teachers

- Mathematics is constructed as White, male, exclusionary institutional spaces that enroll Black students in general or lower track courses even when they have high mathematics achievement [2].
- Marginalized students may not always see themselves as math learners [3].

Research Question

What aspects of inclusive pedagogy are marginalized high-school students report experiencing in their mathematics classrooms?

In particular, how are they experiencing (a) **teacher-student interactions**, (b) **sharing of power**, and (c) **teacher knowledge, skills, and expectations.**

Hypothesis

Students from advanced math courses would be more exposed to inclusive pedagogy practices than the students from general math courses.

Methods

- **Participants:**
  - Schools in the Southeast, USA
  - → 67 focus groups (three to five students)
  - → * 17 advanced math courses groups
    * 50 general math courses groups
  - → mostly 11th grade students from families with limited resources and from marginalized racial identities
- **Coders:**
  - six coders self-identified as:
  - → five women and one man; two Black, one Latina three White
- **Coding:**
  - potential codes based on literature reviews
  - → added or deleted based on consensus after listening to the recordings

Coding Example

Inclusive Pedagogy	Positive Quotes	Negative Quotes
1. Teacher-student interactions: Engaging classroom environment	"…he made the learning environment fun. He made the atmosphere inviting, welcoming and, even though it was challenging things, he made the learning feel like it wasn't learning…"	"…when she's there, all she does is scream and cry. She doesn't teach."
2. Sharing Power: Group work	"when we do group work, when we have group teams... I just feel like it's more understandable than when I do it on my own... We got to do it often."	"We don't work in groups at all"
3. Teacher knowledge, skills, and expectations: Knowledgeable teacher	"She is a good explainer	He doesn't know how to teach, in a way that people understand... He doesn't know how to teach right."

Results

Teacher-student interactions	% of General Math Groups (50)		% of Advanced Math Groups (17)	
Code	Positive	Negative	Positive	Negative
1.1 Individualized input from teacher	36	24	12	24
1.2 Safe space to ask questions	26	40	29	29
1.3 Engaging Classroom Environment	34	38	53	29

- Negative experiences were mostly mentioned by groups of students in the general math course regarding the reaction of teachers when they asked questions, and the classroom environment.

Sharing Power	% of General Math Groups (50)		% of Advanced Math Groups (17)	
Code	Positive	Negative	Positive	Negative
2.1 Group Work	44	32	53	18
2.2 Help Peers	44	14	47	6

- Groups of students in the general math courses more often mentioned the lack of opportunity to work on groups and receive help from peers.

Teacher knowledge, skills, and expectations	% of General Math Groups (50)		% of Advanced Math Groups (17)	
Code	Positive	Negative	Positive	Negative
3.2 Knowledgeable teacher	40	58	82	65
3.3 Contribute to academic success	30	60	29	41

- Groups of students in the advanced math courses more often mentioned positive experiences of having knowledgeable teachers and shared fewer negative comments related to how the teachers contribute to their success.

Discussion and Future Directions

- Aspects of inclusive pedagogy were mostly experienced by students in advanced mathematics courses.
- Though the question was framed positively, students also reported negative experiences with teachers, including lack of attention, humiliation, employment of stressful comments or dynamics, prohibited collaboration, dependence on external resources or knowledge, and lack of interest in their needs.
- Based on the expressions of the marginalized students, we would like to give recommendations to schools on ways in which they could implement an inclusive pedagogy: introduce diverse and entertaining strategies to address a subject, create an environment receptive to questions and promote a growth mindset.

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Project webpage: my.vanderbilt.edu/mathfollowup/