How can I, as a high school mathematics teacher, increase equity for students in my classroom?
Why is it important to work to increase equity in education?

- Reduce poverty, imprisonment, and unemployment rates
- Increase the number of suitable candidates for employment, particularly in mathematics and science related fields
- Increase diversity in the workforce, particularly in professions related to mathematics and science

Research Question

What does it mean to be a culturally responsive teacher in the context of an Algebra I class for repeating ninth graders?

Sub-Questions

1. What are relationships between students and myself as well as among students like?

2. How are high expectations for academics and behavior communicated and enacted in my Algebra 1 class?

3. How do students engage in learning activities in my Algebra 1 class, and how might student engagement be negotiated depending on their individual backgrounds and prior experiences?
Challenges when working with diverse groups of students who have previously been unsuccessful in mathematics courses

- Curricular Tracking
- Student Diversity and Disproportionate Representation
- Teacher Beliefs, Biases and Prejudices
- Lack of Interest in Learning Mathematics among Students

Culturally Responsive Classroom Practices

- Relationship Building
- High Expectations
- Engaging Lessons

Examples of How Culturally Responsive Teachers Focus on Relationship Building

- Communicating with students
- Working on relationships among students
- Intervening when classroom inequities occur
- Personally extending invitations for parents to become involved
- Engaging in critical reflection of their own values, assumptions, and biases
Examples of How Culturally Responsive Teachers Demonstrate High Expectations

- Ensuring that students hear, understand, and practice routines, providing both examples and non-examples
- Modeling metacognitive activities
- NOT permitting students to choose failure
- Using both verbal and non-verbal communication
- Engaging in deep reflection, data collection and analysis
- Considering alternative explanations for behaviors
- Monitoring their own assumptions
- Taking action to improve outcomes when expectations are not met

Examples of How Culturally Responsive Teachers Plan and Implement Engaging Lessons

- Incorporating high interest, engaging activities
- Planning sequences of activities that ensure students have positive first encounters with content
- Attending to student learning styles
- Presenting content in a variety of formats
- Assisting students in constructing knowledge socially, through discourse, activity, and interaction related to meaningful problems

Context of this Study

- Algebra 1 inclusion class for repeating ninth graders
- TL Hanna High School in Anderson, South Carolina
- 2016-2017 school year
Participants in this Study

1. 12 students (5 female/7 male)
2. Demographics

Research Methods

1. Practitioner (Teacher Action) Research
2. Unit 10, Exponential Functions
3. Spring 2017 semester
4. Approximately 3 weeks

Data Collection and Analysis

Data included:
1. Student Interviews (unstructured and semi-structured)
2. A Researcher Journal
3. Observation/Field Notes
4. Lesson Videos
5. Student Work Samples

Both Formative and Summative Data Analysis
Summative Data Analysis Process

- Re-reading transcripts
- Re-reading my researcher journal
- Reviewing the video data multiple times
- Grouping data with similar codes to develop possible themes

What are relationships between students and myself as well as among students like?

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<thead>
<tr>
<th>Code/Theme</th>
<th>Examples of Evidence from Data</th>
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</table>
| Increasing my understanding of students' backgrounds and learning styles | - Two way communication between myself and students about their home lives, community, and funds of knowledge  
- My own reflection and modification of lessons based on observing students |
| Trust of me as the teacher | - Students asking for teacher help  
- Student talk about areas of weakness/problems  
- Students taking risks (or not) |
| Student resistance to working with particular students | - Resistance to randomly assigned groups |
| Trust among students and student risk taking in mathematics | - Students asking for peer help/support (or not)  
- Talk about areas of weakness/problems among peers  
- Students sharing answers confidently (or not), even when there is a risk of being incorrect |

How are high expectations for academics and behavior communicated and enacted in my Algebra 1 class?

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| Communicating expectations to think deeply about mathematical concepts and to explain reasoning | - Students writing down the formula that they selected to use, showed what numbers were substituted into the formula, and showed steps that were used to simplify the expression  
- Students effectively communicating their reasoning when solving problems  
- Students making connections that they saw to prior learning |
| Communicating behavior expectations | - Behavior expectations provided in multiple formats  
- Students self-directing behaviors and transitioning smoothly between tasks |
| Following through with consequences for inappropriate behavior | - Me following through with consequences for misbehavior |
How do students engage in learning activities in my Algebra 1 class, and how might student engagement be negotiated depending on their individual backgrounds and prior experiences?

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<tr>
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| Engagement in Collaborative Group Work | - Collaboration, movement, hands on learning  
  - Students writing, talking about math, using the materials appropriately, and solving problems |
| Disengagement in Collaborative Group Work | - Students working independently and talking about non-math topics during group work  
  - Students not working together to solve problems together |
| Engagement in Teacher-Led Discussions, Notetaking, and Independent Practice | - On-task behaviors such as students writing in their notebooks, verbally responding questions, and watching me as I modeled activities |
| Disengagement in Teacher-Led Discussions, Notetaking, and Independent Practice | - Off task behaviors  
  - Me reminding students to either get started or to stop disturbing their classmates |

Relationships and Communication

- Student trust of teacher
- Peer relationships among students
- The productive struggle in learning mathematics and communicating about thinking

Student Engagement

In general, students did not engage with mathematics in open and authentic manners. This manifested in ways that they did not:

1) Discuss mathematical ideas with their peers  
2) Share mathematical ideas in whole-group discussions, nor  
3) Write down their own ideas until the correct answer was confirmed.
How could I impact student engagement?

- Focusing on the instructional design of the lesson
- Increasing the appeal of the activity to students’ individual learning styles and needs
- Adjusting how I facilitated the lesson
- Always working on relationships and the classroom culture

Moving Forward

- Continuing to identify my own possible negative perceptions and working to change them
- Carefully constructing and modifying lessons to match the unique learning styles and preferences of the students that I am currently teaching
- Doing a better job of advocating for changes to benefit all students and promoting the idea that all students are capable of learning and achieving at high levels
- Continuing to improve upon my classroom culture and build relationships

Conclusion

- This study confirmed what literature suggests as challenges teachers face when working with diverse groups of students who have previously been unsuccessful in mathematics courses.
- This study suggested that my students may have held negative perceptions about their own academic identities and abilities, the abilities of their peers, or their peers’ and teachers’ beliefs about them, but that teachers have the potential to overcome these challenges by becoming more culturally responsive in their instructional practices.
- For the 12 students that participated in this study, the mean score on the Algebra 1 EOCEP was 60.75%. 66.7% (8 of the 12) passed the exam. 83% of the students that participated in this study (10 of the 12) earned credit for Algebra 1.
What does it mean to be a culturally responsive teacher in the context of an Algebra I class for repeating ninth graders?

References


