

Railside High School Study



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The Research Study

- The five year study involved 3 high schools, one urban and two suburban.

At the Urban District

- The study followed Students over 4 years
- 700 students were studied
- 600 hours of classroom observations, assessment, questionnaires.
- 160 interviews with students.

Railside an Urban High School

Enrollment (approx.)	1500
Study demographics	38% Latino/a 23% African Am. 20% White 16% Asian/Pac. Islanders 3% other ethnicities
ELL ¹ students	25%
Free/reduced lunch	31%
Parent education, % college grads	23%

Findings from Student Achievement

- Results from the five year study of three high schools, Railside and two more affluent suburban high schools.
- Entering high school, the means scores of students at Railside were significantly behind compared to the two other schools(mean score 16 vs. 22).
- By the end of the first year (Algebra) the Railside students were outperforming the students in the other two schools.
- By the end of the second year the mean scores of Railside students was significantly higher than the other students (mean score 26 vs. 18).
- By their senior year 41% of Railside students were taking either pre-calculus or calculus versus 27% at the other two schools.

What is Unique

- The guiding theme is **equity for all!** It is a lot more than a slogan, it permeates all instructional decisions.
- The math department has worked together as a team for years and developed a common vision and culture, even though there has been significant turn over throughout the years.
- There is an intense hiring and induction process for new teachers.
- All classes are taught with the principles of Complex Instruction (E. Cohen) to address status issues.
- The curriculum is designed by the math dept. and pulls from reform math programs, CPM, IMP, etc.

The Video

Encouraging Participation (11 min.)

In this case, viewers see the teacher set up and conduct a group participation quiz. She begins by explaining what the students are being asked to do and how it relates to their previous work. She talks about the different representations they will be working with, the grading procedures, and what she expects from students taking on different roles in the group. Viewers see her giving the students immediate feedback on the overhead about their interactions. Viewers also see her quizzing two groups - asking one student in the group to explain the group's solution to a problem and then leaving the groups to discuss the problem together.

Participation Discussion Prompts I

- What do you notice about the types of questions the teacher asks?
- What is the potential impact of the strategy of asking one student to explain?
- We see the teacher patiently persist with a particular student. What do you think of this strategy? When might you use this?

Participation Discussion Prompts II

- Discuss the teacher's introduction and grading strategy - what teaching goals are communicated? What values do they indicate?
- In this clip we see the teacher ask one student to explain, but after approximately 5 minutes, she opens the questions to other group members - discuss the way this interaction unfolded and the impact of this combined questioning.
- What do you think of the teacher's strategy of writing up what the groups are doing on the overhead? What aspects of students work does she focus on? Are there other things she could be focusing on?

Mathematical Connections through Representation (15 min.)

In this case, viewers see the teacher interacting with a group of students as they work on the design of a poster. The poster task requires each student to represent an algebraic relationship with an algebraic equation, graph, t-table, and pile pattern, and to show the connections between the different representations. This clip gives the viewer the opportunity to see student thinking, and to watch the teacher interact with a group of students for an extended period of time.

Connection Discussion Prompt I

- Asking students to design a poster is a particular pedagogic approach - when would you use such an approach?
- The teacher has each boy in the group make their own poster, but all four posters are on the same piece of paper – how might this change the learning opportunities for students, compared with other formats for a poster assignment, such as having each student do a poster independently or having the group do one poster all together?
- What does the experience of designing the poster encourage the students to learn, mathematically?

Connections Discussion Prompt 2

- Make a record of all of the questions the teacher asks and discuss them.
- In the clip with the two boys, how does the teacher respond when Jorge says such things as:
"it's hard"
"by 2?"
"this is different"
"mine is easiest"
- How are the students showing connections between representations/what communication tools are they using?

Building Citizenship

“What makes the class good is that everybody’s at different levels so everybody’s constantly teaching each other and helping each other out.” (Zane, Railside school)

Civil Rights

Thus, the work of students and teachers at Railside was equitable partly because they achieved more equitable outcomes on tests, with few achievement differences aligned with cultural differences, but also because they learned to act in more equitable ways in their classrooms. Students learned to appreciate the contributions of different students, from many different cultural groups and with many different characteristics and perspectives. It seemed to me that the students learned something extremely important, that would serve them and others well in their future interactions in society, which is not captured in conceptions of equity that deal only with test scores or treatment in schools. **Dr. Jo Boaler**

Democracy

It is commonly believed that students will learn respect for different people and cultures if they have discussions about such issues or read diverse forms of literature in English or social studies classes. I propose that all subjects have something to contribute in the promotion of equity and that mathematics, often regarded as the most abstract subject removed from responsibilities of cultural or social awareness, has an important contribution to make. For the respectful relationships that Railside students developed across cultures and genders that they took into their lives were only made possible by a mathematics approach that valued different insights, methods and perspectives in the collective solving of particular problems.

Dr. Jo Boaler