

AN ETHNOGRAPHY OF RE/HUMANIZING (MATH) PEDAGOGIES AT A PREDOMINANTLY LATINX CALIFORNIA HIGH SCHOOL

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This ethnographic study of one predominantly Latinx-serving high school in California theorizes around the functioning of re/humanizing pedagogies layered through the school and the mathematics department as they challenged flattened social, academic, and mathematical identities. Findings revealed that math department practiced built from school-wide commitments, offering students de-flattened identities. However, challenges remained specifically related to the availability of advanced mathematics courses.

Keywords: culturally relevant pedagogy, equity and diversity, high school education, marginalized communities

Colonial projects flatten the histories and lived experiences of minoritized communities, presenting homogenized narratives that label, compare, and sort people into groups for the sake of resource extraction and economic gain (Mignolo, 2003; Said, 2012). Schools are critical sites for the reproduction of these flattened social categories, (Eckert, 1989; Willis, 1977). Mathematics education participates in this project by providing fodder for categories of intelligence through the political legitimacy of mathematics (Apple, 1993) and the proliferation of tracking available in K-12 mathematics education that consistently relegates minoritized students to lower tracks where they are denied quality learning opportunities (Oakes, 1990).

The persistent reproduction of inequitable mathematical learning experiences and outcomes for minoritized students is well documented (Martin 2013; Tate, 1994). Yet, calls for change most often center mathematics pedagogy and programming as sites for intervention without attention to school-wide culture and organization beyond mathematics itself (NCTM, 2018).

This paper presents findings from a school-based ethnography that examined the production and negotiation of identities of mathematical competence across one predominantly Latinx-serving high school in California. The study uses re/humanizing pedagogies as a lens for asking how identities of mathematical competence were produced and negotiated. The dual focus on both whole school and math department commitments and practices revealed both resonance and tensions. Findings demonstrate that school and math department commitments challenged the flattening of social, academic, and mathematical identities to varying degrees of success.

Humanizing Pedagogies and Rehumanizing Mathematics

I use humanizing pedagogies (Bartolome, 1994) as an umbrella term inclusive of those pedagogies that challenge the colonial flattening of minoritized students. Under this umbrella, and specific to this study I focus on pedagogies that center care and relationship (Noddings, 1988; Valenzuela, 2005), and those that embrace responsibility for providing opportunities for academic excellence and supports, especially attending to the most vulnerable or traditionally excluded (Ladson-Billings, 1995; Duncan-Andrade, 2005). Care and responsibility were central commitments of Sierra High School (SHS), the site of the study. Relations of care and deep responsibility for students were understood by SHS staff as challenges to the exclusion and neglect common to experiences of schooling for minoritized students.

Specific to mathematics education, Gutiérrez (2018) poses eight dimensions of rehumanizing practice. SHS math department commitments closely resonated with two: participation/positioning and the broadening of mathematics. Rehumanizing mathematics practices position students as valued participants in mathematics itself, not simply as consumers. A broadening of mathematics includes understanding mathematics as a living practice that entails communication, reflection, visual approaches, and collaboration.

The dual frameworks of re/humanizing pedagogies and practices provided a lens through which to conceptualize the relationship between the school and math department in disrupting flattened social, academic, and mathematical identities to varied degrees of success.

Methods

Ethnography is an anthropological method for tracing cultural production and involving participant observation in the community of study over an extended period of time (Geertz, 1973). Ethnography was chosen for this study to enable mapping production and negotiation of intersecting social and mathematical identities at multiple layers.

Sierra High School, the site of the study was a predominantly Latinx-serving public high school in a small urban district in California. The school faced a history of racialized stigma as the only predominantly low-income and predominantly Latinx school in a highly segregated district. In the years immediately preceding and including the study, the school community was conscientiously working to provide a counter-narrative to this entrenched negative reputation.

Over two school years, the author acted as a participant observer across multiple school contexts including academic and non-academic spaces, with a focus on mathematics teaching and learning. All math teachers were observed and interviewed. Formal and informal interviews were conducted with students and either audio-recorded or captured in fieldnotes. Detailed fieldnotes were produced daily. Artifacts were collected including lesson plans, student work, school brochures, and math course enrollment data by student.

Analysis entailed bi-weekly review of field notes and artifacts and the production of an analytic memo (Emerson, Fretz & Shah, 2011). Analytic memos captured new and recurring themes and critical incidents that illuminated or contradicted details of a developing theme (Creswell & Poth, 2016). The themes of care, responsibility, and de-flattening were identified and elaborated through this process.

Findings

I use two metaphors from SHS – the Energy Bus and the sheep – to illustrate the SHS staff’s commitments to care and responsibility. These school-level commitments permeated the mathematics department as well. A commitment to responsibility was expressed through the providing students an abundance of opportunities for both academic excellence and academic support. These opportunities also provided opportunities for relationships of care between teachers and students. Together, forms of responsibility and care functioned to challenge the flattening of social and academic identity categories, including but not limited to those of mathematical competence. However, challenges remained. Specifically, the availability of categories related to advanced math courses reproduced flattened math identities and racialized the distribution of these positions.

Sierra High School Commitments: The Energy Bus and the Sheep

When I initially approached the SHS math department about research I was enthusiastically welcomed to the “Energy Bus.” The Energy Bus was a metaphor used by the staff to describe the dramatic commitment of energy to students that SHS staff undertook together. This metaphor permeated staff communication. The Google Drive that hosted teacher resources was named “The

Energy Bus.” At the opening staff meeting of school year 2018-2019, new staff were introduced and enthusiastically commanded to “Hop on the Bus!” (Fieldnote 8.10.18).

At the same opening staff meeting the Principal shared a video from her summer trip to Ireland, where she visited a sheep farm. Staff knew that she was raised on a sheep farm, and the use of sheep as a metaphor was familiar. The video showed a tractor and a sheepdog working together to maneuver a herd of sheep across a road into pasture. The sheepdog was seen gently pursuing one sheep who had strayed from the group. After sharing the clip, Principal James asked, “Did anyone think of any likenesses?” Staff called out, “kindness,” “patience,” “encouragement” comparing the role of the sheepdog’s to theirs as teachers. One staff member commented, “You gotta get them all, we’re not going to leave any one on the side of the road.” The principal concluded, “Love always goes way farther with our kids. They need clear boundaries and some sternness, but there has to be love in there.” (Fieldnote, 8.10.18).

The Energy Bus and the sheep metaphors were lived in tandem at SHS, through the provision of a multitude of opportunities for academic and extra-curricular excellence as well as academic and social supports. Centrally organizing the joint commitment to academic rigor and academic support was the combination of two programs: Advancement Via Individual Determination (AVID) and the International Baccalaureate (IB) program. These two programs traditionally have distinct target audiences. An AVID teacher described AVID as supporting “students who could go to college but just didn’t have the things they needed to get there” (Interview, 1.11.19). In contrast, IB coursework and the IB Diploma program provide an elite international certificate of advanced standing.

Students, while enthusiastic about the plethora of high quality academic and extra-curricular opportunities offered, consistently cited their teachers as the best thing about SHS. Students described teachers using words such as “supportive,” “friendly,” “nice,” and “helpful.” One student explained, “All the teachers I’ve had - they were always there when I needed help, so I think teachers are pretty amazing here” (Interview, 10.24.18, 11th grader). Another student said the best thing about SHS was “the connections I feel with my teachers. The more you build connections with them the more confident you feel to ask a question or share during class” (Fieldnote, 9.11.18, 12th grader).

The SHS Math Department: We Keep it Rollin’

SHS math teachers in particular were recognized by students and staff as providing multiple layers of support and care, making themselves available during lunch and after school, and providing opportunities for re-takes of assessments and submission of late assignments. As one guidance counselor said, “Our teachers are here, especially in the math department, all the time. They’re here all the time working with kids that come to see them” (Interview, 10.12.18). Classroom observations captured interactions across all ten math teachers that reflected rapport with students – examples of evidence included the use of humor and making connections to students’ lives within and beyond instructional contexts.

In accordance with NCTM’s articulation of the tenets of high quality mathematics instruction (NCTM, 2014), the SHS math department was committed to student-centered and discourse-oriented approaches to teaching and learning mathematics. These approaches centered student participation and positioned students as authors of mathematical ideas, with students relying on each other for evaluation and revision of those ideas through peer conversation. These practices were in line with Gutiérrez’s (2018) “participation/positioning” dimension of rehumanizing mathematics. Observations of all teachers evidenced that students worked in collaborative groups and engaged in rich mathematical tasks. The department used a set of curricular materials reflecting discourse and sense-making approaches to mathematics. The department collaborated to revise and extend the materials to support and challenge their own students where they saw the need, providing expanded notions of the discipline of mathematics, Gutiérrez’s sixth principle.

De-Flattening: Successes and Challenges

The wide range opportunities available and the commitments of adults to building connections with students provided students multiple access points to into the school community and relatedly multiple opportunities for complex identities. For example, in a space with a majority Latinx student-body this meant that understandings of what it meant to be Latinx were taken for granted as multiple and complex - drum major, IB student, lead actor in the school play, football player, valedictorian, or community service club president.

The particular combination of opportunities and supports combined with the caring teacher relationships also served to broaden notions of academic excellence. For example, students at times were jointly enrolled in IB courses and in AVID. AVID, a symbol of extra support for reaching college, was widely respected at the SHS suggesting a de-flattening of notions of excellence in which making use of a wide range of academic supports was not equated with being a low-achiever or being unsuccessful.

In the context of mathematics, students also articulated complex ideas about mathematical competence where students consistently referenced participation, perseverance, and being able to explain to others as indicators of mathematical competence. While many students also shared notions of mathematical competence that included accuracy and speed, in line with the dominant narratives of success in math (Franks, 1990), the de-flattening of mathematical competence itself provided expanded opportunities for students to identify as people with mathematical competence.

One significant challenge to the de-flattening of identities through re/humanizing pedagogies at SHS was the fact that the multitude of programs made available a multitude of categories related to these courses and programs. While the aspirational vision of the school was one where every student benefited from both IB-level rigor and AVID-informed supports, the particular prestige of IB courses was recognized by students as a marker of comparative intelligence and status. In the math department specifically, Latinx students were underrepresented in IB courses and in their advanced prerequisites.

Discussion and Implications

School-wide commitments to care and an outpouring of energy through academic and extra-curricular programming was reflected in the mathematics department through student-teacher relationships and was extended through pedagogical commitments to student-centered, sense-making pedagogies that offered expanded views of mathematics and therefore more expansive and inclusive opportunities for students to identify people with mathematical competence.

Careful attention to the school context revealed the ways in which school level commitments shaped the aspects of rehumanizing mathematics practices taken up in the math department. Findings suggest that the rehumanizing math practices that math teachers develop will draw from whole-school commitments. At the same time, there may be tensions between the school-level conceptualization of humanizing pedagogies and enactment in the mathematics context. For example, mathematics education is one of the disciplines most susceptible to notions of comparative categories, including both advancement and remediation, such that the multitude of high quality opportunities at SHS, while largely celebrated by students and families, played into the reproduction of widely available of narrow, comparative, and racialized categories of math student.

References

- Apple, M. W. (1993). What post-modernists forget: Cultural capital and official knowledge. *Curriculum Studies*, 1(3), 301–316.
- Bartolome, L. I. (1994). Beyond the Methods Fetish: Toward a Humanizing Pedagogy. *Harvard Educational Review*, 64(2), 173–195.

- Creswell, J. W., & Poth, C. N. (2016). *Qualitative inquiry and research design: Choosing among five approaches*. Sage publications.
- Duncan-Andrade, J. M. (2005). Developing Social Justice Educators. *Educational Leadership*, 62(6), 70-73.
- Emerson, R. M., Fretz, R. I., & Shaw, L. L. (2011). *Writing ethnographic fieldnotes*. University of Chicago Press.
- Franks, M. L. (1990). What myths about mathematics are held and conveyed by teachers?. *The Arithmetic Teacher*, 37(5), 10.
- Geertz, C. (1973). "Thick Description: Toward and Interpretive Theory of Culture" and "The Impact of the Concept of Culture on the Concept of Man." In *The Interpretation of Cultures* (pp. 3–54).
- Gutiérrez, R. (2018). The need to rehumanize mathematics. In *Rehumanizing Mathematics for Black, Indigenous, and Latinx Students*. Eds. Imani Goffney, Gutiérrez, R. & Boston, M. Introduction, p. 1-10. Reston, VA: NCTM.
- Ladson-Billings, G. (1995). Toward a Theory of Culturally Relevant Pedagogy. *American Educational Research Journal*, 32(3), 465–491. <https://doi.org/10.3102/00028312032003465>
- Martin, D. B. (2013). Race, Racial Projects, and Mathematics Education. *Journal for Research in Mathematics Education*, 44(1), 316–333. <https://doi.org/10.5951/jresmetheduc.44.1.0316>
- Mignolo, W. (2003). *The Darker Side of the Renaissance: Literacy, Territoriality, and Colonization*. University of Michigan Press.
- National Council of Teachers of Mathematics (NCTM). (2014). *Principles to Actions: Ensuring Mathematical Success for All*.
- National Council for Teachers of Mathematics (NCTM). (2018). *Catalyzing Change in High School Mathematics: Initiating Critical Conversations*. Reston, VA: NCTM.
- Noddings, N. (1988). An ethic of caring and its implications for instructional arrangements. *American Journal of Education*, 96(2), 215-230.
- Said, E. W. (2012). *Culture and Imperialism*. Vintage.
- Tate, W. F. (1994). Race, Retrenchment, and the Reform of School Mathematics. *Phi Delta Kappan*, 75477.
- Valenzuela, A. (2005). Subtractive schooling, caring relations, and social capital in the schooling of US-Mexican youth. *Beyond silenced voices: Class, race, and gender in United States schools*, 336-347.