

What is "Nepantla" and How Can it Help Physics Education Researchers Conceptualize Knowledge for Teaching?

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Abstract. This article draws on Latina/Latino studies to offer physics education a potential framework for reconceptualizing the “knowledge” teachers will need to engage marginalized students. Drawing on Gloria Anzaldúa’s notion of Nepantla (a liminal space that facilitates transformation), I offer examples of teacher candidates as they come to recognize multiple realities in teaching mathematics to urban high school students. I suggest that as we prepare teachers, we must help them not only recognize a state of Nepantla (to see and participate in multiple realities) but also come to expect the uneasiness with being in that space as it offers potential for new knowledge.

Keywords: knowledge for teaching, equity, mathematics, identity, power.

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INTRODUCTION

Based on the research I have conducted on effective teaching for African American, Latina/o, and working class students over the past 15 years, I have outlined four equity dimensions: Access, Achievement, Identity, and Power [1]. Discussions of “access” (e.g., quality teachers, rigorous curriculum, current technology and supplies) and “achievement” (e.g., standardized test scores, course participation patterns, the math pipeline) have historically been part of conversations on equity and span subject matter. However, equity means fairness/justice, not sameness. It is centrally about power – in the classroom, in one’s life outside of the classroom, in a global society. So, in our efforts to address equity, we must consider whether our goals should stop at merely closing the “achievement gap” [2] or getting more people to understand more sophisticated concepts in mathematics (or physics).

Mathematics education researchers who focus on equity have moved beyond considering these dominant perspectives on equity and have pushed an agenda that offers a more critical stance on education, embracing identity and power issues. This critical perspective suggests, among other things, that students should be able to maintain their cultural identities while doing mathematics; that teachers and students should develop the ability to see inequities in the world and to take social action through doing mathematics; and that

researchers are able to see the process by which students are “racialized” in schools.

Over the past 12 years, I have worked in a setting where I am preparing university students to become secondary mathematics teachers. In addition to helping them expand their knowledge of mathematics to support their students “playing the game,” I also work to help them see the importance of a critical perspective – helping their students “change the game” [3]. As winners of the system, teachers with which I have worked often fail to realize that society is not based on a meritocracy. They do not always question the hierarchy of intelligence or know how to connect with students on a level that draws out students’ cultural and linguistic resources (e.g., recognizing that most mathematics classrooms require students to park their culture/language at the door). On the one hand, I want them to see the importance of this critical perspective (e.g., expanding their repertoire of teaching practices to include such things as social justice mathematics), but I do not expect they will forget about the dominant perspective of helping their students to become highly proficient participants in a high status field. Although I understand quite clearly the complexity around these issues and am able to keep in mind a bigger picture of my goals, I needed a language for discussing the tensions/dilemmas of addressing both goals (dominant and critical) with my secondary mathematics teacher education candidates.

I found that language in the field of Latina/Latino studies.

NEPANTLA AND TEACHING

Gloria Anzaldúa, long known for her work on border theory and mestiza consciousness, offers the concept *Nepantla* [4,5]. *Nepantla* is a liminal space where multiple realities are viewed, a kind of "third space" that describes the "everywhere" and "no where" at the same time. In *Nepantla*, new forbidden knowledges develop that disrupt previous categories. In essence, *Nepantla* fosters transformation.

According to Anzaldúa, people pass through phases of "being open to others and willing to know" called *conocimiento* and "distancing or choosing not to know" called *desconocimiento*. Based on the Spanish verb "conocer" (meaning "to know") that requires a connection or familiarity with someone or something, the idea of knowledge/*conocimiento* presented by Anzaldúa allows for an incorporation of beliefs and attitudes not normally ascribed to knowledge needed for teaching. To help readers understand cycles of knowledge/*conocimiento* and ignorance/*desconocimiento*, she discusses the word "Nos/otras." In Spanish, *Nosotras* as an entire word means "us/we," as in the subject in the sentence, "Nosotras estudiamos la física" (We are studying physics). However, *nos* as an indirect object can also mean "us," as in "Favor de darnos el gis" (Please give us the chalk). Finally, *otras* means "others." By placing a slash in the middle of the word, Anzaldúa highlights the fact that the word "nos/otras" can be seen as either a single word, *nosotras* (favoring an "us" only position), or as two words, *nos/otras* (acknowledging a interconnected us/them position). Being able to see both the *nos* and the *otras* in the word *nosotras* shows one's openness to connecting with others and in seeing a different (potentially conflicting) perspective than one's own.

When one can see these two realities simultaneously, it opens the door for a potentially new world view, one that can better capture these two realities without dissolving them into one (as is often implied in professional stances like "mathematics for all"). In this heightened state of consciousness, one is thrust into *Nepantla* – the birthplace of new knowledge.

I return to my work with teacher candidates to illustrate the usefulness of *Nepantla* and the cycle of *conocimiento* in education [6]. As part of coursework, my students partner with an alternative Chicago public school, engaging in mathematical explorations and other activities with high school students and their math teacher over a one-year period. The school with

which we partner serves primarily Latina/o students, many who have been "pushed out" of their previous schools. These are neither the kinds of students my teacher candidates are imagining will be in their first classroom nor ones with which they share many interests or previous experiences.

As part of our equity work, we examine curricula. My students usually have little difficulty articulating the importance of a "quality" or "rigorous" mathematics curriculum, though some do not agree that it should look like the inquiry-based problems promoted by the National Council of Teachers of Mathematics [7]. What my students often fail to recognize is that no curriculum is politically neutral. Many of them also have not considered whose identities are supported by a given curriculum and/or how students are positioned in doing NCTM-based mathematics. In other words, they are able to see the "nos" in *nosotras*, but not necessarily the "otras."

During our partnership, my students have opportunities to see a fairly skilled teacher using an NSF-supported mathematics curriculum in which concepts are favored over memorization and mindless drilling. In the beginning, the teacher candidates are somewhat skeptical that "inner city" students, many for whom Spanish is their first language, can handle the rigor of such a curriculum. However, some argue that it can serve as a means to address equity, especially for students who have not historically had access to a "quality" curriculum. Throughout the year, the teacher candidates are further convinced of its value when they see how well the high school students have developed the ability to make conjectures, defend their positions, and represent their data and thinking in multiple formats. Yet, at one point in the partnership, they recognize that the curriculum does not reflect the lives of the students. That is, while the high school students are developing their proficiency in mathematical discourse and are able to see connections between such things as geometry and probability, the examples in the problems they are solving have little to do with their lives outside of school. It is at this point that the teacher education candidates are able to see that the NSF-supported curriculum could be both supporting equity (providing access to rigorous mathematical concepts) and not supporting equity (requiring students to park their lived experiences at the door) at the same time.

While the teacher candidates were frustrated and yearned for a simple solution – for me to decide once and for all whether or not this curriculum addressed equity - they also were in a fruitful place for being able to think through the complexity of equity. They were in *Nepantla*. By offering them the language of *Nepantla*, showing them that their ability to see both views signaled a shift in their thinking, they were able

to resist the desire to come to a quick conclusion as to what they would do in the same teaching situation. Instead, even though they were uncomfortable with the situation, they thought through many different strategies, including supplementing the curriculum to offer greater opportunities for students' experiences to be valued.

Too often, discussions of equity make it seem as if the answers are simple or can be cured with a single bullet – e.g., eliminating tracking. However, the reality of schooling in a global society is that addressing equity requires being able to see multiple, even contradictory views, especially with respect to identity and power. Rather than a list of prescribed practices, it requires a stance on teaching that seeks to grapple with the tensions and dilemmas of preparing students to play the game while also supporting them to change the game. For example, teaching involves both knowing one's students (in the sense of needing to connect with them and understanding their cultural and linguistic resources) and not knowing one's students (in the sense of not objectifying them or being satisfied with yourself that your knowledge is complete). When teacher education candidates and those researching physics classrooms are able to recognize these states of Nepantla, our strategies for attending to all four equity dimensions increase. Only then will we begin to support both teachers and their students to engage in and transform the field of physics

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