

SCIENCE PARA EL BARRIO

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ABSTRACT:

I am the son of my mother. My mother, among many other attributes, is a protector of earth. I am a science educator. While growing up in NorthEast Los Angeles, my mother taught me science. She did not sit me at a desk and lecture me, she showed me. She did not deposit knowledge for memorization, rather she engaged me in practice. She is a healer, she is a chemist, she is a physicist, she is a botanist, she is a biologist. My mother only completed three years of formal education. From a western perspective of education this might mean that she is illiterate and does not possess the adequate qualification to be considered a knowledgeable individual. That belief however, is wrong. It is a byproduct of a mindset within a colonial framework. That belief is a byproduct of colonization. Colonization is a violent, insidious process that harms everything it touches. Present conditions for what is considered valid knowledge are not natural, but unnatural and built on the belief that certain knowledge is valuable and other knowledge is not.

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¿QUIÉN SOY?

I am the son of my mother. My mother, among many other attributes, is a protector of earth. I am a science educator. While growing up in NorthEast Los Angeles, my mother taught me science. She did not sit me at a desk and lecture me, she showed me. She did not deposit knowledge for memorization, rather she engaged me in practice. She is a healer, she is a chemist, she is a physicist, she is a botanist, she is a biologist. My mother only completed three years of formal education. From a western perspective of education this might mean that she is illiterate and does not possess the adequate qualification to be considered a knowledgeable individual. That belief however, is wrong. It is a byproduct of a mindset within a colonial framework. That belief is a byproduct of colonization. Colonization is a violent, insidious process that harms everything it touches. Present conditions for what is considered valid knowledge are not natural, but unnatural and built on the belief that certain knowledge is valuable and other knowledge is not.

My mother is a product of her parents and that means that her knowledge and practices descend from my grandparents'. My grandparents worked the land in their native Mexico, they nourished the land with their blood and sweat. They were sustained by the land in their small rural town in Michoacan. My grandparents' knowledge and practices descended from those that came before them and so on and so on. Those that came before me depended on the land to live, therefore they respected the land, learned from the land, and protected the land. The term indigenous to me means to respect those that came before you, to carry their knowledge and practices and to take up their struggle. And so being raised by my mother, I learned from her. I learned from her daily practices. I learned from our conversations.

I learned what western science calls Biology through gardening, through raising animals, and through caring for our loved ones. I remember my mother showing me how to clone a savila (aloe vera) plant by snipping off a lead and rooting it in another part of the garden. Then she explained to me that it would grow just as the mother plant, as long as we provided it with space to grow, water and sunlight. I recall that the first plant I ever grew from seed was a strawberry plant. My mother showed me how to dig a hole, prep the soil, place the seed, and water away. As the weeks passed I checked the growing strawberry plant on a daily basis and was fascinated by the first stem, then leaves, then flower, then strawberry fruit. My mother explained how life goes in cycles and through the process of growing a strawberry plant I understood a life cycle as a characteristic of living things.

I learned what western science calls chemistry and medicine through the remedies that my mother made from plants in her garden. She showed me how the ruda plant can be soaked in rubbing alcohol and then used as an anti-inflammatory if a bandana is soaked in the solution and then applied to the aching part of the body. I also learned that you can take leaves from the ruda plant and make it into a tea that helps with upset stomachs. My mother explained that there was medicine in the plant. I came to understand that alcohol is a solvent and placing the ruda plant in alcohol, allows for the medicine in the plant (i.e. the medicinal chemical) to be released. I came to understand that boiling the leaves in water has a similar effect.

I learned what western science calls physics through taking care of our garden. When a plant was growing at an angle and my mother wanted to change the direction she would plant a stake in the ground in an upright manner and tether the stake to the plant. She explained that the weight of the plant or the angle at which the sun hits the plant might cause it to grow in a different direction. I came to understand that forces could cause a change in direction.

What I learned from my mother was taught through a purpose. She was passing on to me knowledge that was passed to her. She did not call it science, but that's what it was. She was teaching me how to understand the natural world through a relationship of respect, not through one of exploitation.

CONTRADICTIONS OF THE SCIENCE CLASSROOM SPACE

Traditional science education is far removed from the lived experiences of our youth. Western Scientific thought is a framework of colonialism, which attempts to enculturate students into the culture, knowledge, techniques, values and worldview of academic Eurocentric science (Aikenhead G.S, and Elliott, D. 2010, 322). As a framework it values certain knowledge as scientific and disregards the knowledge of the "other." Within traditional science education we are taught to value western perspectives of science and to disregard others. The dominant view of what counts as science through a western scientific perspective regularly promotes a limited view of the world we live in. As a child going into a science classroom, I recall learning topics that were abstract and removed from my lived experience. As I grew older and continued my studies of science, I began to see that many of the concepts that were taught played a role in my everyday life. Why did it take so long for a connection to be made?

Eurocentrism as an epistemic framework is foundational to the maintenance of colonial power structures within schooling. According to Kincheloe (2008), there is a standardized view of knowledge in traditional schools, based on a Eurocentric worldview (75). Such a curriculum then has a certain "valid" body of knowledge, which it seeks to pass on to students. Battiste (1998) has described cognitive imperialism as a process of colonization where people are denied their indigenous knowledge when only one form of knowledge is legitimized through public education (20). The science curriculum of traditional schools can be seen in this same vein. Specifically, within the traditional science curriculum, eurocentrism allows for non-western knowledge to be invalidated and cast as inferior. Indigenous knowledge, if not valued in the science classroom space, reinforces the colonial structures of the classroom. What does it say about the current state of science as a tool, when students are asked to devalue the knowledge they bring from home because according to Eurocentric standards it does not qualify as science?

As an educator we must live in a constant state of critical reflection. We must understand, acknowledge, and at the same time resist a system of acculturation that we are a part of. Yes, as an educator we are part of a system of oppression and at the same time a potential source of liberation. As a science educator I must never stop being critical, I must never stop being reflective, I must never stop asking the questions: whose knowledge is valid knowledge? Whose knowledge is being centered? Whose knowledge is being silenced? However, I must continuously work to

deconstruct power dynamics within my classroom and encourage a space where young people would be empowered. As an educator I am part of the system of schooling that has caused harm to so many young people. I must accept this reality, I must acknowledge this reality, I must resist this reality.

My work is related to indigenous ways of knowing because at the center of my practice as a science educator is the understanding that what is taught as a traditional science curriculum stems from a western scientific perspective. A perspective of science that is rooted in a Eurocentric worldview. A perspective that is rooted in enlightenment thinking. The same thinking that was foundational to imperialism and the colonization of indigenous people around the globe. The same thinking that developed and justified racial hierarchies as a means of subjugation. The same thinking that promoted the study of Eugenics. The same thinking that promotes a false narrative of intelligence as measured through I.Q. The same thinking that developed technology based on the exploitation of the earth for capital gains. And at the core of my practice is a purpose, to deconstruct the violent beliefs that ground western scientific thought.

A SCIENCE LEARNING SPACE WHERE MANY KNOWLEDGES FIT

How do I, as a science educator, resist colonialism? The same way that my mother has, the same way that her mother did, the same way that those that came before her did, I struggle. Every opportunity I get to struggle toward the destruction of colonial systems, I do. Within my classroom, I acknowledge that the practice of education has been used as a tool of colonization and struggle to create a space where young people are able to reconnect with indigenous science. Science Para El Barrio is a concept that seeks to decolonize the space of science learning. Science Para El Barrio seeks to use the lived experiences of youth as the context for science knowledge creation and youth empowerment. Within the science classroom space, we do this by understanding the current state of science and the perspective of the world that is encouraged by western scientific thought. We ask the questions: Who does science benefit? Who does science harm? Who does science forget? Can there be a science built on love and respect? Can there be a science that is truly human? Can there be a science that struggles for justice? Students collaborate to develop a philosophy of science that is grounded in respect for the natural elements of earth. At the heart of the resistance to colonialism within our classroom space is the struggle to create a world where many worlds fit (Enlace Zapatista, 2016). Within the classroom space I encourage students to respect and learn from each other's' cultural knowledge and to develop a practice of science that is open to multiple ways of knowing, not just a western perspective.

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