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Social Justice in the Science Classroom

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Science classes are diverse places to learn with students bringing multiple identities to classrooms, such as race, gender identity, socio-economic status, religion, and more. For example, a *Latina female* student may be an *atheist* and live in *poverty*. How these four identities intersect impact how she will approach scientific study, laboratory experiences, and mindful class discussions. But how often do science teachers take these identities into account when planning, executing, assessing, and reflecting on a lesson?

Schools and science classrooms should be places for a more just society than currently exists. This “justness” is vital to address our biases and privilege.

The majority of teachers in the United States are White and privileged. This doesn’t mean that we haven’t faced poverty, hardship, and challenges; however, we don’t face each day knowing our skin color influences stereotypes people hold. People of color live each day wondering how they will be taught and what opportunities will or won’t come their way.

Effective teaching in all science education settings must consist of a thorough understanding of science as well as a deep understanding of the cultural background of students with multiple identities (Fusco 2001; Lee and Fradd 1998 in Emdin 2010, p. xii).

What can we do to make science classes more inclusive for ALL students and to help society become a more just place for everyone? Let’s consider the following strategies:

Science grounded in the lives of students

Our classrooms must be grounded in the lives of students. If urban youth are

influenced by hip-hop and rap, then we must infuse these music forms into teachings in a non-tangential way. (Emdin 2010).

Hip-hop and rap, with its Caribbean roots, resonate with urban youth by giving them voice to their frustrations and challenges. By infusing hip-hop and rap into science classes, we can reach students who disdain the regiment of school, which may or may not have any relationship to their everyday lives. Whatever identities exist in your classes, ground the science into students’ lives in a meaningful way so that justice prevails and they feel included.

The curriculum should help students pose critical questions like: Who made these decisions? Who was left out? Who benefits and who suffers? Whose voices were silenced? What are the origins of the ideas and policies? We must design lessons around real-world scenarios, bringing the NGSS to life in a meaningful manner. Drilling for standardized tests disenfranchises students since it silences their voices in an inequitable manner.

A democratic science classroom

In a democratic classroom, students can question, challenge, make real decisions, and solve problems facing society today, such as climate change, cloning of humans, nuclear energy, or bioengineering. But, they must do so in a way that highlights their identities.

A Native American student may see the destruction of Earth for fossil fuels in a different way than an Appalachian student whose parents work in the coal industry. The juxtaposition of these two important identities are critical for de-

signing solutions to scientific problems. Could the reduction of fossil fuels lead to more jobs within the clean energy industry, thus reducing the fears of the Appalachian students' concern over their parents' employment prospects?

Safe havens

Classrooms must be safe places, both emotionally and physically, for all students. If not, students will not share real thoughts about the concepts covered. Lessons must help break down barriers that may exist due to the multitude of identities.

Activism

We should want our students to be activists. What does activism have to do with a science class? If we ask students to critically examine the natural world but then never give them the opportunity to act, then we have only created a rhetoric of action. One example includes having students attend town meetings where land use is being debated and where they have a voice in the decision-making of their community.

Students whose parents are anti-vac-

cinators must read the infamous paper by Andrew Wakefield that stated how MMR vaccines were implicated in causing autism and was published in the elite scientific journal the *Lancet*. After a two-year hearing, the General Medical Council in the U.K. found that the author was “misleading,” “dishonest,” and “irresponsible” in the way he described where the children in his 1998 study came from. His tests on these children were done without ethics committee approval (Goldacre 2010) and later found to include falsified data.

One of the key issues in this scenario is how the media ran with the story without proper vetting or a real investigation into how the science was done. Media literacy is paramount to addressing these kinds of issues.

Academically rigorous

A *social justice* classroom propels students more forward than in a *traditional* classroom and expects more from ALL students. Test scores and grades only address extrinsic thinking. We must encourage students to embrace intrinsic

thinking in a way that embraces who they are, what they bring to the classroom, and the differences they can make in the world through science.

Again, science must be relevant to their lives. Do they write blog posts? Do they create instructional, informative YouTube videos? Do they post meaningful, content-related information on other forms of social media? Making science come alive and having students address critical social issues creates a more socially just environment, where all students truly are created equal.

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- Emdin, C. 2010. *Urban science education for the hip-hop generation: Essential tools for the urban science educator and researcher*. Boston: Sense Publishers.
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Suggested topics to infuse social justice in the science classroom:

- Food Deserts
- Environmental Racism
- Tuskegee Syphilis Study
- The Opioid Epidemic
- The 80s Crack Epidemic and Fallout
- Industrial Dumping
- Asthma in Urban Spaces
- Denial of Greenspace
- Lead in Drinking Water
- Henrietta Lacks (Racism in Cancer Research)
- Abnormally High Rates of Cancer in Black Populations
- Vaccines and the Anti-Vaccine Movement
- Effects of the Foster System on Development
- Effects of Solitary Confinement on the Brain
- Incarceration and Institutionalization Complex
- Science and Gender Identity
- Human Experimentation/Exploitation
- Partial/Whole Human Cloning
- Genetic Discrimination
- Eugenics and Racialized Genocide
- Population Control
- Population Growth and Resource Management
- Science of Language and Lingual
- Oppression
- Gender Bias and Sexism
- Mass Incarceration
- Search Algorithm Bias
- Prescription Opioid Abuse
- Third World Pharmaceutical Trials
- Mental Health and Treatment Disparity
- Science in Hip-Hop Music
- Access to Healthcare
- Infant Mortality
- Quality Housing and Health
- The Effects of Abuse and Trauma on the Brain
- Exclusion of Women/Minorities from Science