



## GUEST COMMENTARY

Sam Long

### Making Space for Gender Diversity in the Biology Classroom

Biology is one lens through which we see ourselves and, in turn, find our place in the world. We all are curious about our bodies, our behavior, our health, and wonder how we got here. But what happens when we *don't* see ourselves in the biology we are taught?

I came out as a transgender man in high school. Although I faced social exclusion, I found solace and a sense of purpose in my studies. In Biology, my favorite class, I learned that XX chromosomes were for women and XY chromosomes were for men – *except that didn't seem to line up with my reality*. I learned that meiosis makes egg cells in women and sperm cells in men – *except me*. I felt my transgender identity was incompatible with the version of biology offered in school.

Indeed, most biology curricula do not acknowledge gender diversity. So, when I became a biology teacher, I shared my trans identity with my students and made it a priority to actively include students of all identities.

I now start by clarifying whether the terms *male* and *female* refer to chromosomal sex or gender identity in our class. I refer to conditions that involve the sex chromosomes (like Klinefelter Syndrome) using the less stigmatizing term *intersex traits*. I emphasize the significance of these changes by saying, “Science texts often assume that a person’s sex chromosomes match their gender identity, or how they feel inside. This is not always true, and it’s not true for me as a trans person. I won’t perpetuate that misconception – sex chromosomes influence a person’s physical development, but they do not dictate identity or how you live your life.”

I have found the following definitions very useful in moving this conversation forward:

- *Gender identity*: A personal sense of one’s own gender, self-determined and distinct from sex assigned at birth.
- *Sexual orientation*: A person’s attraction toward others as distinct from gender identity.
- *Transgender*: Broadly, anybody who does not fully identify with the sex assigned to them at birth.
- *Intersex*: Differences in sex traits or reproductive anatomy, compared to the usual two ways that human bodies develop.

I have enriched many lessons with discussion of gender, sex, and sexuality. In genetics, I teach that the X and Y chromosomes play only an initiating role in the complex process of sexual differentiation. In evolution, I teach about diverse reproductive strategies like sex-changing clownfish and same-sex swan parents. My students learn that diversity is a norm in nature, not an anomaly or disease.

In one end-of-semester survey, a student told me, “I’ve never had a teacher discuss LGBT relationships or even acknowledge they existed. I think all teachers should acknowledge this.” In a 2017 poll, only 2.4% of students reported being taught positive representations of LGBTQ people in science class. This is a missed opportunity, since an inclusive curriculum is correlated with greater feelings of safety, increased attendance, and decreased victimization for LGBTQ youth.

Through the Trans Educators Network, I met biology teachers Lewis Steller and River Suh and together we created GenderInclusiveBiology.com. This growing collection of resources for teaching accurate, inclusive, and future-ready biology is founded on the following five curriculum elements:

- *Authenticity*: Select accurate language that acknowledges both gender diversity and scientific precision (e.g., “Ovaries produce eggs” in meiosis, not “Women produce eggs”).
- *Continuity*: Consistently include gender, where applicable, as one of many lenses for analysis. Begin units from a diversity perspective instead of teaching an oversimplification (e.g., “All men are XY”) that is later changed for exceptions.
- *Affirmation*: Highlight and celebrate the naturally occurring diversity of gender, sex, and sexuality in all species. Frame diverse phenomena to increase curiosity rather than as sensational or pathological.
- *Anti-oppression*: Encourage students to identify and analyze the patterns that inform society’s status quo. Help students recognize recurring injustices, such as intersex genital mutilation, court-ordered sterilization and chemical castration of LGBTQ individuals, and sex verification in sports.
- *Student agency*: Provide students choices and habitually incorporate a student feedback cycle. Students engage more when they explore their own questions and make decisions, especially in learning about gender, sex, and sexuality.

Gender-inclusive biology looks different in every classroom. For elementary students, exploring diverse animal bodies can open conversations about gender diversity. In middle school, coordination between the science and health curricula is essential. Students will inevitably see overgeneralized language that contradicts the full spectrum of biology – we must teach students to recognize and question problematic themes. Even small changes, like saying “people with testes” instead of “males with testes” in the context of spermatogenesis, send messages of inclusion.

Leading education organizations endorse gender-inclusive biology teaching. The NABT Position Statement on Equity in Science Education states, in part: “Diversity contributes to the richness of biological science understanding and ways of knowing [and] enhances our educational and scientific discourse.” A parallel statement from NSTA asserts: “When teaching topics such as reproduction or evolution, limiting discussions of gender or sexuality solely to male-female heterosexuality may unwittingly marginalize students who do not identify with these roles and miss important opportunities for exploring the diversity of reproductive strategies.”

I continue to be inspired by the increasing number of educators now engaging in the work of gender-inclusive biology. Only when we make space for gender diversity in our classrooms do we truly allow all students to see themselves as part of the biology they are taught and continue the enjoyment that comes from learning about life.

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