

# Supplemental Material

*CBE—Life Sciences Education*

Maas *et al.*

**Supplemental Table 1. Glossary of terms related to the LGBTQ+ identity<sup>a</sup>**

**Asexual:** An umbrella term used to describe someone who does not experience physical and/or sexual attraction. Some describe this as having a lack of attraction toward others or as the experience of not being sexually attracted to others. The term “**Ace**” is a colloquial abbreviation often used to describe someone who is asexual, in the same manner “straight” is used to represent someone who is heterosexual. Ace also includes people who are gray-asexual and demisexual (defined below).

**Aromantic:** A term used to describe someone who does not experience romantic attraction. It is sometimes colloquially abbreviated to “**Aro.**”

**Bisexual:** An umbrella term used to describe someone who is emotionally, physically, and/or sexually attracted to more than one gender.

**Cisgender:** A term used to describe someone whose gender identity and sex assigned at birth align (e.g., female and female-assigned at birth).

**Cisnormativity:** The assumption that all individuals are cisgender.

**Coming Out:** Voluntarily making one’s sexual identity or gender identity known to others. Coming out to someone or in a certain venue does not mean that an individual is out to everyone in their life.

**Gay:** A term used to describe individuals who are primarily romantically, physically, and/or sexually attracted to members of the same gender. This can be used to describe someone of any gender identity.

**Genderqueer:** A term that describes a person whose gender identity cannot be categorized as solely male or female

**Heteronormativity:** Norms and practices that assume binary alignment of biological sex, gender identity, and gender roles and that establish heterosexuality as a fundamental and natural norm.

**Intersex:** Describes someone whose combination of chromosomes, gonads, hormones, internal sex organs, and genitals differs from the two expected patterns of male and female.

**Lesbian:** A term used to describe people who identify as women and are attracted romantically, physically, or sexually to others who identify as women. Some women prefer to use the term “queer” or “gay” instead of lesbian.

**Non-binary:** A term used to describe individuals who do not identify their gender as man or woman. Additionally, people who identify their gender as nonbinary may identify as being both man and woman, somewhere in between man and woman, or as someone whose gender does not fall within the categories of man and woman.

**Pansexual:** Describes someone whose romantic, physical, and/or sexual attraction is not defined by sex or gender identity.

**Queer:** An umbrella term used to describe individuals who identify as nonstraight or who have nonnormative gender identity. It is important to note that this term historically was offensive, and while some members of the community continue to find this term offensive, others take pride in reclaiming it.

**Transgender:** A term describing a person who lives as a member of a gender other than that expected based on anatomical sex designated at birth. Notably, being trans does not require a “transition.” An individual can be transgender and not “live as” their identity because of legal, familial, societal, health, etc., reasons. The term “transgender” is an adjective, not a noun, and the term “transgendered” is never appropriate.

<sup>a</sup>The terms in this glossary were taken verbatim or adapted from the following resources:

Asexuality.org ([Asexual Visibility & Education Network](#), 2019); Asexuality Archive ([AsexualityArchive](#), 2012); Excluded ([Serano](#), 2013); Gender performativity and self-perception: Drag as masquerade ([Strübel-Scheiner](#), 2011); [Glaad](#), 2019; Hate crime: Impact, causes, and responses ([Chakraborti and Garland](#), 2009); Human Rights Campaign Glossary of Terms ([Human Rights Campaign](#), 2018c); *Merriam-Webster Dictionary* ([Merriam-Webster](#), 2019); National LGBTQIA+ Health Education Center Glossary ([National LGBTQIA+ Health Education Center](#), 2020); The invisible orientation: An introduction to asexuality ([Decker](#), 2015); Safe Zone Project Core Vocabulary 2.0 ([Safe Zone Project](#), 2019); University of California Berkeley Gender Equity Resource Center Definitions of Terms: ([UC Berkeley](#), 2019); University of California Davis LGBTQIA Resource Center Glossary ([University of California Davis](#), 2019)

## **Coding Rubric**

**CENTRALITY:** Student describes how the centrality of their LGBTQ+ identity impacts their experience as a student in biology.

**Being more/less out creates more/less conflict:** student describes that their LGBTQ+ identity is not central to their identity and therefore they do not experience as much conflict with science or the scientific community or they describe that their identity is very central which has made conflict with science or the scientific community greater.

**PERCEPTIONS OF CULTURAL STIGMA:** Student describes perceiving some kind of cultural stigma against LGBTQ+ in biology

**Variation:** Student says there is variation in how biologists in different fields view LGBTQ+ people

**Irrelevant w/Science:** Student says that people in the biology community view speaking about LGBTQ+ identity not important due to science being fact-based and empirical

**ANTICIPATED STIGMA:** Student describes anticipating stigma if they were to reveal their LGBTQ+ identity

**Sexualization:** Student worries that biologists (older straight men specifically) stereotype LGBTQ+ people (especially bisexual/pansexual women) as more sexual, and focuses on their sexuality more than their work

**Irrelevant w/Science:** Student worries that people in the biology community view speaking about LGBTQ+ identity not important due to science being fact-based and empirical

**Social hierarchy:** Student says they worry about perceptions of their LGBTQ+ among more prestigious biologists or people who are “higher up” OR they worry about coming out to undergrads in fear of being unprofessional

**Less scientifically capable:** Student says they worry that someone would question their scientific ability/credibility if they were to reveal that they are LGBTQ+

**Applying for lab positions:** Student says they are concerned about their PI and/or lab's view on LGBTQ+ people

**Not really LGBTQ+:** Student worries their identity will not be believed or taken seriously

**Will not be able to get a job if institution does not like LGBTQ+ people:** Student worries that if a PI and/or employer does not feel comfortable about LGBTQ+ identities, they will not be able to get a job/position there

**EXPERIENCED STIGMA:** student describes an instance in which they experienced stigma about LGBTQ+ people in the biology community.

**Mostly neutral/positive experience:** Students say that most experiences they have with biologists revealing their LGBTQ+ identity are positive or neutral.

**Jokes/negative comments about LGBTQ+ people:** Student describes that people in the biology community make negative statements about LGBTQ+ people or jokes about the LGBTQ+ community

**Irrelevant w/Science:** Student says they have experienced people telling them it was unnecessary to bring up their LGBTQ+ identity or thinking they could not focus as much on hard science since they would be interested in diversity/inclusion aspects as well

**Treated differently:** Student says they were treated differently by peers/advisors, and/or peers/advisors seemed to feel uncomfortable around them

**CONCEALING:** student describes that they have concealed their identity in some context in biology in which it was relevant to them

**Mental Labor:** Student describes concealing their identity due to the burden of having to explain their LGBTQ+ identity to those in the biology community (they don't want to "deal with it")

**Anti-LGBTQ+ people:** Students describe concealing their identity when someone displays anti-LGBTQ+ behavior

**Unprofessional:** Student says they think talking about their LGBTQ+ identity would be unprofessional

**Maintain professional connections:** Student says they hide their identity if they think that it will harm their professional relationship with higher ups

**Specific group(s):** Student says they do not reveal their identity to a specific group(s) due to higher chance of them imposing negative beliefs about their LGBTQ+ identity

**REVEALING:** Student describes that they have revealed their identity in some context in biology in which it was relevant to them

**When relevant/if asked:** Students say they only bring up their LGBTQ+ identity when it is relevant.

**To other LGBTQ+ individuals:** Student describes revealing their LGBTQ+ identity when they know the other person is LGBTQ+

**To "safe" others:** Student describes revealing their LGBTQ+ identity when they have an established/trusting relationship with the other person or when the person seems genuinely interested in having a respectful discussion

**To correct misconceptions:** Student says they reveal their identity when correcting misconceptions biologists have about LGBTQ+ people or about their own identity

**When talking about partner(s):** Student says they reveal their LGBTQ+ identity when discuss their partners

**Clothes/Jewelry/Accessories/conduct:** Student describes wearing Pride clothes or having a Pride flag, or acting in a more "stereotypically queer" way, which may reveal to others that they are LGBTQ+

**Applying for lab positions:** Student says they reveal their LGBTQ+ identity to the PI when applying for a lab in order to ensure the PI and lab is LGBTQ+ friendly

**Implied outness:** Student thinks that they way in which they look/dress/conduct themselves outs them without them explicitly stating it; or they use cues to signal that they are not straight

**OUTNESS:** Student describes how "out" they are about their LGBTQ+ identity in biology

**Not talked about/taboo subject:** student says it is not a topic that is generally brought up or talked about

**Is covert:** students say that they are not really comfortable revealing their identity and avoid revealing

**Not outspoken:** student says they are not outspoken about their LGBTQ+ identity

**Does not hide it/if they are asked:** Student says they do not hide their identity

**Wants to be themselves:** Student says they do not hide because they want to be able to be their true selves.

**Social media:** Student says they are out on social media

**Awkward to come out:** Student says it is difficult to find a time or instance where they could bring up their identity naturally

**Very open/out:** Student describes how they are very open with people and do not try to hide their LGBTQ+ identity

**Out to PI:** Student states they are out to their PI

**Out to grad students/postdocs:** Student states they are out to any grad student/post docs in their lab

**Out to undergraduates:** Student states they are out to any undergraduates

**IMPRESSION MANAGEMENT:** student describes their LGBTQ+ identity in a way that reduces negative impressions.

**Keeps them separate:** Student describes that they keep their LGBTQ+ identity and scientific areas of their life separate from one another

**Can be a better teacher:** Student describes that their LGBTQ+ identity allows them to be more conscious of their language and curriculum, as well as being more conscious of the importance of representation of other marginalized identities

**Wants to be an advocate:** Student says that them being out can provide good examples of LGBTQ+ people in biology for undergraduates and can increase representation of LGBTQ+ people in biology

**Changes behavior/appearance:** Students states that they change their behavior or appearance to be less stereotypically "gay"

**Different language:** Student reports referring to their identity or their partner in a different way to avoid negative connotations

**Comes out implicitly:** Students states that they reveal their identity implicitly in order to prevent negative reactions

**SALIENCE:** student describes contexts that increase or decrease the relevance of their LGBTQ+ identity in the biology community.

**Conferences/Workshops/Happy Hours:** Student describes a time when their identity comes up at conferences, workshops, or happy hours; at conference functions specifically held for LGBTQ+ people

**Partner discussions:** Student says their identity comes up when talking about their partner or plans (i.e. going to a gay bar)

**When Teaching/Learning Biology:** Student says their identity comes up in the context of teaching/learning biology

**Field matters:** Student says the field they are in makes their LGBTQ+ identity either more relevant or less relevant

**Other identities matter:** Student describes how other identities (gender, race, LGBT, mental health, international) decrease or increase the relevance of their LGBTQ+ identity in biology

**Institution/region matters:** Student describes how their institutional or regional culture either makes it easier or harder for them as a LGBTQ+ person in biology

**Genetics and sexual reproduction topics:** Student describes the topics of genetics and sexual reproduction as something that is salient to their LGBTQ+ identity

**During field work:** Student says their identity more relevant during field work due to being in a less accepting region

**Talking to other LGBTQ+ people:** Student says they think of their identity when around other LGBTQ+ people

**Gender Expression:** Student states that they dress differently/fit less into gender stereotypes than colleagues OR hetero/cis-normativity makes them more aware of their differences

## NON-CSI CODES

**Felt valued by person in biology community:** Student states that someone in the biology community did something to make them and/or LGBTQ+ identity feel valued

**Did not feel valued by person in biology community:** Student states that someone in the biology community did something to make them and/or LGBTQ+ identity feel not valued

**Helpful to know an LGBTQ+ faculty member/higher up:** Student says that knowing an LGBTQ+ higher up allows them to feel better about their identity and future career

**Not their full self:** Student says they cannot be their true/full self around people who do not know about their LGBTQ+ identity

**Uncomfortable occupying LGBTQ+ space:** Student says they feel uncomfortable navigating/occupying a greater LGBTQ+ space due to them not being visibly LGBTQ+

**Comfort level determined by external cues:** Student says cues such as pronouns being asked for and other LGBTQ+ people in a space make them more comfortable; and vice versa

**Know climate:** Student says that it is important to know the climate of the university, region, and lab before going into grad school

**Cannot live somewhere:** Student says they would not go to a specific region due to anti-LGBTQ+ attitude

**Might not continue in academia:** Student states that due to negative, or potential negative, experiences (in regard to their LGBTQ+ identity), they don't want to continue a career in academia

## TEACHING/MENTORING

**Mentoring LGBTQ+ students:** Student states they specifically enjoyed taking a mentor position or helping LGBTQ+ students; or they state that there should be more LGBTQ+ people mentoring students

**Makes teaching more inclusive:** Student describes how they teach biology to make it more inclusive/welcoming toward LGBTQ+ students

**Worried about authority while teaching:** Student states that they worry that students will take them less seriously if they do not conform to the way a "typical" biology person looks

**Presented/wants to present material differently:** Student says that they chose to present course material in a way that validates LGBTQ+ identities

**Doesn't bring LGBTQ+ identity into classroom:** Student says that they do not bring their LGBTQ+ identity into the classroom

### **Interview Script**

We are going to talk about your experiences in graduate research as someone who identifies as LGBTQ. Graduate research refers to your research experience in your scientific research lab.

“How do you identify as a member of the LGBTQ+ community?”

“Within the culture of biology, how do you think people see LGBTQ people? Why?” (cultural stigma)

“If you were to tell someone in the biology community that you are a member of the LGBTQ+ community would you worry about what they would think about you? Why or why not?” (anticipated stigma)

“When you are interacting with scientists, are you ever reminded of your LGBTQ identity?”  
(salience)

“To what extent do people in the biology community know that you are a member of the LGBTQ community?”  
(outness)

“Do you think people generally assume that you are a member of the LGBTQ+ community? Explain.”  
*The following questions ask about whether you make your membership in the LGBTQ+ community explicit.*

“Specifically, are you out to your PI?”

“Are you out to other graduate students/postdocs?”

“Are you out to undergrads? In your lab? In your classes that you TA?”

“Can you tell me about instances in the biology community when you have had the chance to reveal that you are LGBTQ, but decided not to?” (concealing)

“Can you tell me about instances when you have revealed that you are LGBTQ to someone in the biology community?” (revealing)

“Have you revealed your LGBTQ identity to your advisers or mentors? Why?”  
(concealing/revealing)

“Have you revealed your LGBTQ identity to your undergraduate students? Why or why not?”

“How do you decide whether to tell someone in the biology community that you are LGBTQ?”  
(concealing/revealing)

“Are there particular ways you talk about your LGBTQ identity in the biology community to avoid any negative perceptions?” (impression management strategies)

“Has anyone in the biology community ever done anything that made you feel like they did not value your LGBTQ identity?” (experienced stigma)

“Has any biology content been presented to you as a student that made you feel like your LGBTQ+ identity was not valued or was negatively perceived?” (experienced stigma)

“Has anyone in the biology community ever done anything that made you think they valued your LGBTQ identity?” (improving experiences of LGBTQ students in biology)

“Given your LGBTQ identity, how might you positively impact the field of academic biology?” (Impression management strategies)

“Given your LGBTQ identity, how might you be negatively impacted as you continue in the field of academic biology? (experienced stigma)

“What advice would you give another LGBTQ student who is going into a biology graduate program?” (improving experiences of LGBTQ students in biology)

“How might the biology community increase participation of LGBTQ students in biology?”

### **Extra Questions**

#### ***Teaching***

“To what extent do you bring your LGBTQ+ identity with you into the classroom? Please explain.”

“To what extent are you out to your students when you TA?”

“To what extent do you intentionally conceal your LGBTQ+ identity when you TA?”

“Do you perceive that your LGBTQ+ identity has positively impacted your teaching in any way?”

“Have you ever had a negative experience teaching in the classroom because of your LGBTQ+ identity?”

“Do you think you have ever presented biology content differently given your LGBTQ+ identity?”

“Have any of your prior experiences learning biology content that were negative influenced how you currently teach?”

“To what extent has an undergraduate come and talked to you about the LGBTQ+ identity?”

“Did you explicitly tell them about your LGBTQ identity?”

“Have you ever served as a mentor to an LGBTQ+ undergraduate in your class given your LGBTQ+ identity?”

#### ***Role Models***

*Now, I am going to ask about any potential connections that you may have with a research scientist who openly identifies as a member of the LGBTQ+ community. One will be based on any personal relationships that you may have, and the other will be based on your knowledge of an LGBTQ+ research scientist with large external platforms such as social media.*

“Do you personally know a research scientist who openly identifies as a member of the LGBTQ+ community?”

**(If yes)** “How has personally knowing a research scientist who openly identifies as a member of the LGBTQ+ community affected you?”

**(If no)** “If you personally knew a research scientist who openly identified as a member of the LGBTQ+ community how would it potentially affect you?”

“Do you know **of** a research scientist on social media or other large external platforms who openly identifies as a member of the LGBTQ+ community?”

**(If yes)** “How has knowing **of** a research scientist who openly identifies as a member of the LGBTQ+ community affected you?”

**(If no)** “If you personally knew **of** a research scientist who openly identified as a member of the LGBTQ+ community how would it potentially affect you?”

“How often are topics that can be related to LGBTQ issues discussed within the context of biology? Is it mainly in a more colloquial setting, or is it in lectures?”

## **Post-Interview Survey**

**How long have you been in your PhD program?**

Less than one year

One year

Two years

Three years

Four years

Five Years

Six years

More than six years

I have finished my PhD program

**Which university do you attend/have attended?**

**What would be your ideal career once you graduate?**

**On a scale of 1-10, to what extent do you consider yourself out about your LGBTQ+ identity?**

1 (not at all)

2

3

4

5

6

7

8

9

10 (extremely)

**On a scale of 1-10, to what extent do you consider yourself a science person?**

1 (not at all)

2

3

4

5

6

7

8

9

10 (extremely)

**On a scale of 1-10, to what extent did you experience conflict between your LGBTQ identity and the science community during undergraduate?**

1 (not at all)

2

3

4

5

6

7

8

9

10 (extremely)

**On a scale of 1-10, to what extent did you experience conflict between your LGBTQ identity and the science community so far in graduate school?**



- 1 (not at all)
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 (extremely)

**What is your parents' highest completed level of education? If you have more than one parent with differing levels of education, choose the higher of the two.**

- Less than high school completed
- High school diploma or GED
- Some college but no degree
- Associate degree (for example: AA, AS)
- Bachelor's degree (for example: BA, AB, BS)
- Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
- Higher than a Master's degree (for example: PhD, MD, JD)
- Decline to state

**I most closely identify as:**

- Woman
- Man
- Non binary
- Decline to state
- Please describe your gender identity if the best option is not listed:

**What LGBT+ identity do you hold?**

**What is your race/ethnicity that most closely aligns with your identity?**

- American Indian, Native American, or Alaskan Native
- Asian or Asian American
- Black or African American
- Hispanic or Latino/Latina
- Native Hawaiian or Other Pacific Islander
- Middle Eastern
- White or European American
- Multiracial
- Decline to state
- Other not listed, please describe:

**Please indicate your political identity:**

- Very liberal
- Liberal
- Slightly liberal
- Moderate
- Slightly conservative
- Conservative
- Very conservative
- Decline to state