

# Supplemental Material

*CBE—Life Sciences Education*

Chasen and Pfeifer

## Supplementary Materials for

# Empowering Disabled Voices: A Practical Guide for Methodological Shifts in Biology Education Research

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**Included in this file are alternative versions of Table 1 and Table 2 to support screen-reader accessibility**

### Inventory

- **Pages 2-3: Table 1.** The tenets of DisCrit and example questions for biology education researchers
- **Page 4: Table 2.** Selected questions from Boveda & Annamma (2023) to guide the writing of the authors' positionality statement (Box 1 in main text)
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**TABLE 1**

The tenets of DisCrit and example questions for biology education researchers (Annamma et al., 2013). These questions represent how the DisCrit tenet could be operationalized in the context of biology education research in terms of both research focus and methodological approach. We consider these to be potential questions. We do not intend for this list to be prescriptive of all possible inquiries, but to serve as a starting point for researchers to conceptualize the tenets. Citations indicate sources that discuss these questions or exemplify how this question can be addressed

<b>DisCrit tenet (DisCrit...)</b>	<b>Potential questions</b>
1. Focuses on ways that the forces of racism and ableism circulate interdependently, often in neutralized and invisible ways, to uphold notions of normalcy.	<ul style="list-style-type: none"> <li data-bbox="824 569 1414 720">– In what ways do racism and ableism jointly inform perceptions of “normal” in biology contexts (i.e., courses, research, departments, professional societies, etc.)? (e.g., McRuer, 2006; Kafer, 2013)</li> <li data-bbox="824 751 1414 903">– How can decisions about curriculum, policies, and resources relevant to biology students, instructors, and/or faculty be made using anti-racist and anti-ableist lenses? (e.g., Scott &amp; Shogren, 2023)</li> </ul>
2. Values multidimensional identities and troubles singular notions of identity such as race or disability or class or gender or sexuality, and so on.	<ul style="list-style-type: none"> <li data-bbox="824 936 1414 1003">– Who is included in a study population? Who is excluded? (e.g., Cole, 2009)</li> <li data-bbox="824 1094 1414 1213">– In what ways can a single individual be simultaneously privileged and oppressed based on the dimensions of their identity? (e.g., Cole, 2009)</li> <li data-bbox="824 1245 1414 1365">– Should participant data be aggregated? How can aggregation be done in a way that reduces essentialism? (e.g., Vaccaro <i>et al.</i>, 2015)</li> </ul>
3. Emphasizes the social constructions of race and ability and yet recognizes the material and psychological impacts of being labeled as raced or disabled, which sets one outside of the western cultural norms.	<ul style="list-style-type: none"> <li data-bbox="824 1398 1414 1518">– What strengths or assets do study participants use to navigate racism and ableism in biology contexts? (e.g., Braun <i>et al.</i>, 2017; Renken <i>et al.</i>, 2021; Mireles, 2022)</li> <li data-bbox="824 1612 1414 1732">– How are ableism and racism produced, used, experienced, and processed at the individual and institutional levels in the populations we study? (e.g., Ken, 2008; Tan <i>et al.</i>, 2022)</li> </ul>
4. Privileges voices of marginalized populations, traditionally not acknowledged within research.	<ul style="list-style-type: none"> <li data-bbox="824 1766 1414 1860">– How can research about disabled people of color in biology contexts be co-constructed? (e.g., Scott &amp; Shogren, 2023)</li> </ul>

DisCrit tenet (DisCrit...)	Potential questions
<p>(continued from page 2)</p> <p>4. Privileges voices of marginalized populations, traditionally not acknowledged within research.</p>	<ul style="list-style-type: none"> <li>– How can the power and positionality of researchers and decision-makers in biology contexts be made more visible? Do opportunities to explicate how power informs research and dissemination exist? (e.g., Boveda &amp; Annamma, 2023; Scott &amp; Shogren, 2023)</li> </ul>
<p>5. Considers legal and historical aspects of disability and race and how both have been used separately and together to deny the rights of some citizens.</p>	<ul style="list-style-type: none"> <li>– What historical and cultural events (both broadly and locally) contribute to ableism and racism in biology contexts? (e.g., Hales, 2020; Branch <i>et al.</i>, 2022)</li> <li>– What are the consequences of ableist and racist legal and historical aspects on individuals in biology? How do these consequences manifest in the lives of participants now? (e.g., Lillywhite &amp; Wolbring, 2019; Mellifont, 2023)</li> </ul>
<p>6. Recognizes whiteness and ability as property and that gains for people labeled with disabilities have largely been made as the result of interest convergence of white, middle-class citizens.</p>	<ul style="list-style-type: none"> <li>– In what ways has whiteness and ability served to gatekeep who accesses biology and participates in biology spaces? (e.g., Blaisdell, 2017, 2020)</li> <li>– How is social power (relating to whiteness and ability) operating in the situation studied? (e.g., Grzanka, 2020)</li> <li>– How can power associated with whiteness and ability be re-distributed to be more equitable, inclusive, or just? (e.g., Yeh, 2023)</li> </ul>
<p>7. Requires activism and supports all forms of resistance.</p>	<ul style="list-style-type: none"> <li>– What role(s) can biology education researchers take on in addressing the social and structural problems unearthed in research? (Grzanka, 2020)</li> <li>– How can biology education research address constructs and systems, not only identities? (Grzanka, 2020)</li> <li>– How can the findings of biology education research be shared in ways that promote meaningful change in the lives of disabled people of color? 8/9/2024 4:02:00 PM</li> </ul>

**TABLE 2**

Selected questions from Boveda & Annamma (2023) to guide the writing of the authors' positionality statement (Box 1). A few questions have been slightly modified. We encourage biology education researchers to consult the original and complete set of guiding questions from Boveda & Annamma (2023) as they craft their own positionality statements.

<b>Element</b>	<b>Guiding question</b>
<b>Ontoepistemic</b>	<ol style="list-style-type: none"> <li>1. What does the theoretical framing of your study say about how power relations are reproduced?</li> <li>2. How do the theories you use explicitly address racism, ableism, cisheteropatriarchy, and other oppressions?</li> </ol>
<b>Sociohistorical</b>	<ol style="list-style-type: none"> <li>3. What are you doing to recognize the genealogy, assumptions, and potential for harm within your research?</li> <li>4. How will you recognize and disrupt power dynamics with your work?</li> <li>5. What are the social implications of dialoguing about harmful institutional histories?</li> </ol>
<b>Sociocultural</b>	<ol style="list-style-type: none"> <li>6. What are the sociocultural identities you share with your participants and research team members?</li> <li>7. What are the interlocking systems of oppression that your participants and research team members may face that you do not?</li> <li>8. How does the source of your knowledge production resist essentialism about your participants and research team members and represent in group variance?</li> </ol>

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