

Supplemental Material

CBE—Life Sciences Education

Goodwin *et al.*

SUPPLEMENTAL MATERIALS

Perspectives from undergraduate life sciences faculty: Are we equipped to effectively accommodate students with disabilities in our classrooms?

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S1. Interview recruitment email text

Hello,

We are a team of biology education researchers at Arizona State University working to improve student experiences in undergraduate science courses. We are specifically interested in how **students with disabilities** navigate college science.

To our knowledge, there have been few studies that have explored students with disabilities in the context of college science. We believe that it is very important to learn more about the experiences of students with disabilities to create a more inclusive biology community. We are particularly interested in how faculty members and instructors accommodate students with disabilities in their courses, as well as any challenges that individuals may face in this process.

After completing the interview, you will complete a brief demographic survey. Participation in the research is voluntary, and you must be 18 years or older to participate.

If you would be willing to share your insights, please fill out this poll with the most convenient time for you: [\[Insert link to poll\]](#)

We are planning to conduct all interviews over Zoom for your convenience. If you have any questions, please contact Dr. Sara Brownell (sara.brownell@asu.edu).

Thank you for considering!

S2. Semi-structured interview questions

Background questions:

- Do you teach undergraduate science courses at your institution?
- Do you have any personal experience interacting with a student with disabilities in an undergraduate science course that you have taught?

Perceptions/Understanding of disability and accommodation process:

- To your knowledge, how does your institution classify “disability” for students?
 - Which types of disabilities are eligible for accommodations?
- Do you know what the requirements are for receiving accommodations from your institution?
- What would count as an accommodation for an eligible student with a disability?
- Given your best guess, approximately what percentage of students in undergraduate biology use university-supported accommodations?
- Given your best guess, approximately what percentage of students in undergraduate biology do you think report having disabilities?
- If a student has a mental health condition (e.g., anxiety or depression), do you know if that student is eligible for disability services at your institution?
- What do you think universities are required to do to support students with disabilities?
- As best you can, please describe the average process by which a student with a disability would need to go through to receive accommodations at your institution.
 - If a student happens to experience a challenge with using an accommodation, what do you think the process would look like for the student to resolve their issue? How might they navigate this?
 - Based on your understanding, what role does the instructor play in helping the student navigate such a challenge?

Attitudes and perceptions about accommodations

- When you are teaching, how often do you think about the need to accommodate students with disabilities?
- How do you feel when you receive an email from your disability resource center about the need to provide accommodations for a student?
- Do you generally feel that the requested accommodations are reasonable to provide?
 - What types, if any, do you find unreasonable? Why?
- Do you generally feel that the requested accommodations are fair to provide?
 - Why or why not?

Prior experience working with students with disabilities:

- To what extent have you interacted with your university’s disability resource center? Please describe these interactions (e.g., email, telephone, Zoom, 1:1 meeting).
- Please describe your approach to accommodating students in the science courses that you teach:
 - Specifically, what actions, if any, do you take after receiving an email or notification of a student with a disability?

- What actions, if any, do you take prior to being notified of a student with a disability (e.g., prior to the semester or designing a course)?
- We know instructors are busy and receive many emails, including those from the disability resource center. Can you remember a time where you have forgotten about accommodating a student?
 - Did anyone follow up with you? Were there any consequences for not accommodating the student?
- Please briefly describe some of the common teaching practices that you use (for example, lecture, clicker questions, group work, pair-share).
 - To what extent do accommodation requests that you receive impact the teaching strategies you choose to use in your classes? How well do accommodations work with your teaching practices?
 - To what extent do accommodation requests that you receive impact how students experience your teaching strategies?
- For this portion of the interview, we would like to ask about several items that may be helpful in accommodating students with disabilities. These are a series of yes/no questions where you can feel free to elaborate. Have you ever:
 - Met with a DRC coordinator to discuss common challenges students may experience with certain practices you use (e.g., active learning)?
 - Contacted the DRC before your course starts to discuss any changes to your teaching practice (for example, during the pandemic to online or if you are incorporating a new teaching strategy)?
 - Provided the DRC with your course syllabus for an overview of your course structure?
 - Met with an instructional designer to consider the design of your course for students with disabilities?
 - Met with students individually to discuss their approach to your course given the challenges related to their disability?

Training/recommendations in better supporting students with disabilities:

- What would be helpful for you, as an instructor, to better support students with disabilities in your science courses?
- To what extent have you received any formal training on how to accommodate students with disabilities?
 - Would training be helpful? If so, what would you like it to entail?
 - What would motivate you to attend? Would you go if it was voluntary?
- Are you familiar with term Universal Design for Learning? [If so, can you describe what it is?] [Provide definition “UDL is a framework, derived from architecture, that attempts to design accessible learning environments and curricula to accommodate all learners without specialized adaptation or accommodation”]
 - [If yes] To what extent have you worked to incorporate it into your courses?
 - What additional help or resources, if any, might you need to incorporate it into your courses?
- Is there anything else that you would like to add or share about your experiences?

S3. Interview codebook

Code	Memo
Accommodations are manageable <i>Codes relate to a faculty instructor's expectation of their ability to successfully provide accommodations</i>	
Generally simple or easy	States they generally do not have to do much work to provide accommodations
Technology reduces difficulty	Explains that technology or learning management systems operate in a way that makes providing the accommodations easier (usually by automating accommodations)
Teaches in a manner to reduce individual accommodation need	States that because the requested accommodations are already provided to all students or are not relevant to the class design, they do not specifically need to address certain accommodations (e.g., notes/slides already provided to all students before class, all students get a lot of time for exams, etc.)
Covid policies had positive impact	Explains that because of the pandemic/Covid/recent move to online teaching, they have incorporated more accessibility aspects into their course structure for all students
Providing accommodations is "just part of the job" ¹	States that they consider providing accommodations or ensuring accessibility to be a natural part of their job responsibilities as faculty instructors
Strengths of the institutional system <i>Codes relate to a faculty instructor's expectation of their ability to successfully provide accommodations</i>	
Supportive faculty or administration	Discusses the support they receive from other faculty, colleagues, or administration for inclusive teaching/accessibility for students with disabilities
Supportive DRC	Discusses how the DRC or other disability-specific staff/support is effective in meeting their needs or providing support
Deficits of the institutional system <i>Codes relate to a faculty instructor's expectation of their ability to successfully provide accommodations</i>	
Lack of transparency in accommodations system	Explains they do not sufficiently know or understand how the disability resource center or accommodations process operates, and/or the accommodations process is confusing in a way that makes their instructional duties more difficult
Lack of communication between faculty and DRC	Communication with DRC is limited/minimal/insufficient (e.g., they feel they do not receive sufficient communication from the DRC, they do not receive enough information about student needs or expected accommodations, or they do not have sufficient dialogue with the DRC to discuss their specific course)
DRC is slow, bureaucratic, or insufficient	States that the DRC does not always meet student's needs in a timely fashion, can be slow and difficult for students with disabilities to access

Accommodation-related decisions are outside of faculty control	States that they have no ability or that it would be unfair for them to provide informal accommodations before they have received official notification from the DRC for student accommodations
Students need to proactively request accommodations	States that students need to take more responsibility for securing their own accommodations, or for asking/reminding/contacting the instructor to let them know they would like to use their accommodations
More paid personnel needed to provide accommodations	States that they believe there should be more personnel (e.g., teaching assistants/staff, DRC staff, or others) who are specifically designated to help meet the needs of students with disabilities
DRC staff need discipline-specific knowledge	States that they believe the DRC staff responsible for identifying appropriate accommodations should have more discipline-specific knowledge to help students succeed in specific types of courses (e.g., lab courses, field courses)
Lack of expertise in DRC staff	States they believe that DRC staff at their institution are sometimes insufficiently skilled to support instructors (e.g., provide low-quality training, misinformation, demonstrate lack of expertise related to disability and/or education)
More training needed	States that faculty instructors receive insufficient training to provide accommodations or understand student needs
Tech/physical spaces aren't accessible	States they need physical classroom spaces that are more accessible and/or more technology to make the class more accessible
Adding extra unpaid work/time to faculty schedules ²	States that handling accommodations is extra work or extra time on top of their (or their TA's) other workloads, and it may feel like extra unpaid labor or that they lack time in their schedule to fit it in
Responsibility falls primarily on faculty ²	Discusses how the burden of providing the accommodations falls primarily on the instructors, rather than others within the university system
Impossible to meet everyone's needs	Indicate that they do not prioritize providing accommodations or increasing equity and accessibility in their classes, or states that they believe that they are unable to meet the needs of every student, because there are too many different needs or needs may not be justified
Lack of incentives/requirements for faculty to improve accommodations ³	Highlights the lack of incentivized or required accessibility-related training or pressure to improve accessibility in their classes, and/or feel that requirements/incentivization is necessary to improve faculty's ability to support students with disabilities in their classes
Accommodations are fair <i>Codes relate to a faculty instructor's Attainment value for providing accommodations</i>	
Improves student learning/ability to demonstrate knowledge	States that accommodations improve student learning experience or "level the playing field," either for students who receive accommodations or for all students when disability-inclusive course elements are available to all students
Necessary for inclusivity	States that accommodations are necessary to create inclusive classrooms or are a moral obligation to provide.

Makes class more like the “real world”	Explains that providing accommodations better mimics the “real world” or what student’s future careers may be like (e.g., you rarely have deadlines for submitting a scientific manuscript, so flexible deadlines in class is logical)
Accommodations are unfair <i>Codes relate to a faculty instructor’s Attainment value for providing accommodations</i>	
Students may take advantage of the system	States that some students may take unfair advantage of the accommodations system (e.g., requesting or using accommodations when they do not need them to get an advantage over their classmates)
Do not prep students for the “real world”	States that by providing accommodations, we may be creating unrealistic expectations for students with disabilities or not sufficiently preparing students who use accommodations for the “real” workforce outside of college
May reduce quality of education	States that by providing accommodations or incorporating disability-supportive elements into their classes, the quality of education may be reduced—either for the student receiving accommodations or for all students
Accommodations can be burdensome <i>Codes relate to a faculty instructor’s perceived Costs for providing accommodations</i>	
Lack of support from other faculty or the institution	States they need more support for students with disabilities from other instructors or the university system
Technology adds difficulty	Describes that technology or the classroom learning management system can be inconvenient and difficult to use when providing accommodations (often this is due to a lack of built-in automation)
Large number of students	States that the large number of accommodations and/or having large class sizes can be overwhelming and/or a barrier to ensuring accommodations for all who need them
Difficulty dealing with students	States that it can sometimes be stressful, tense, or an emotional burden to work with students who need accommodations (e.g., students may be stressed about ensuring their accommodations, may lack trust in instructors, or may come off as unprofessional, unfriendly, unpolite, or overly demanding)
Tension between accommodations and desired teaching practices	Instructors feel that they cannot use their desired teaching materials or methods while providing accommodations (e.g., cannot use video because of no transcription, or cannot use same teaching strategy while providing slides in advance)
¹ Also is relevant to characterizing general attitudes and Intrinsic value for providing accommodations. ² Also are interpreted as perceived Costs for providing accommodations. ³ Also is relevant to characterizing personal Utility value for providing accommodations.	