Supplemental Information for

*New online accommodations are not enough: The mismatch between student needs and supports given for students with disabilities during the COVID-19 pandemic*

Logan E. Gin¹, Danielle C. Pais¹, Kristen Parrish², Sara E. Brownell¹*, Katelyn M. Cooper¹*^  

1 Research for Inclusive STEM Education Center  
School of Life Sciences  
Arizona State University  

2 Research for Inclusive STEM Education Center  
Del E. Webb School of Construction  
School of Sustainable Engineering and the Built Environment  
Arizona State University  

* These authors contributed equally  

^ Corresponding author email: Katelyn.Cooker@asu.edu  

This supplement contains the following:

| This supplement contains the following                        | Page |
|---------------------------------------------------------------|------|
| Outreach email sent to students                               | 2    |
| Copy of survey questions analyzed                             | 3    |
| Coding rubric with code descriptions (Table S1 & S2)          | 6    |
Outreach email sent to students

Hello students!

We are biology education researchers from [University] looking to conduct a study on students’ experiences in online college science courses! We are interested in hearing what you think about online college science courses. Your thoughts and opinions will help us improve the way science is taught at [University] and across the U.S.!

If you have been enrolled in at least one **ONLINE college science course** and would like to help us out by providing us with your opinion, we ask that you would participate in this study by taking a 15-minute survey about your thoughts in exchange for extra credit in the course(s) you were recruited from; you may receive extra credit in multiple courses from which you were recruited. If you do not wish to participate in this survey, there will be an alternative extra credit option available in your class. If you are in multiple courses that will be offering extra credit through this study, we would like you to provide all of your instructors' names so we can make sure your extra credit is accounted for in all the classes.

You will provide your name in the survey so that we can tell your instructor you completed the survey and they can give you extra credit. However, your instructor will never see your name associated with your other responses to the survey. This survey will be completely voluntary and confidential. Your survey responses will not affect your grades at all. Your instructors will never see your answers to this survey. Please do not use instructor names or that of others when responding to the open-ended questions.

You may skip any question if you do not wish to answer it. Your participation in this study is voluntary. You must be 18 years or older to participate in the study.
Copy of survey questions analyzed

1. Have you currently, or previously, been impacted by one or more of the following conditions? (Check all that apply):
   - Learning disability (e.g., dyslexia)
   - Mental health and/or psychological disability (e.g., anxiety, depression, bipolar disorder)
   - Physical disability (e.g., cerebral palsy, spina bifida)
   - Chronic health condition (e.g., cancer, diabetes)
   - Vision loss (e.g., blind)
   - Hearing loss (e.g., deaf)
   - Other (please describe)
   - None of these apply

2. Are you currently registered for services through [University] Disability Resource Center (DRC) for Spring 2021?
   - Yes
   - No
   - Unsure

3. Has the online format of Spring 2021 online science courses led to any new challenges for your disability?
   - Yes
   - No
   - Prefer not to say

4. Have you actually received any new or adapted accommodations from the DRC for your Spring 2021 online science courses?
   - Yes
     - [If yes] Please describe the new or adapted accommodations that you have received during Spring 2021?
   - No

5. Given your disability, to what extent do you feel like you are currently being properly accommodated in your online college science courses?
   - Properly accommodated (all my needs are met)
   - Somewhat accommodated (some of my needs are met)
   - Not accommodated (none of my needs are met)
6. [If properly accommodated or somewhat accommodated was selected] Please tell us about any accommodations that you are receiving in the online science learning environment that are helpful to you.

7. [If somewhat accommodated or not accommodated was selected] Please select any of the following that apply:
   - I have had trouble accessing note-taking accommodations that I used to access during in-person science courses
   - I have had trouble accessing a quiet, distraction-free testing environment
   - I have not had access to longer times to take exams
   - Video proctoring software (e.g., RPNow) creates additional issues for my disability
   - The extra time spent on the computer creates additional issues for my disability
   - I have had issues accessing video lectures or other instructional materials given my disability (e.g., videos not closed-captioned)
   - Instructors have forgotten about my accommodations
   - Instructors have not recognized my need for accommodations given the online learning environment
   - My accommodation is not possible to be delivered online
   - Other, please describe

8. Please tell us about any ideas you have for accommodations in the online science learning environment that you are not receiving that could be helpful to you.

9. I most closely identify as
   - Woman
   - Man
   - Non-binary
   - Other, please describe
   - Prefer not to say

10. I most closely identify as
    - American Indian or Alaska Native
    - Asian
    - Black or African American
    - Hispanic, Latinx, or Spanish origin
    - Pacific Islander
    - White/Caucasian
    - Other, please describe
    - Prefer not to say
11. What is your parent or guardian's highest level of education? If you have more than one parent or guardian 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 (e.g., AA, AS)
- Bachelor's degree (e.g., BA, AB, BS)
- Master's degree (e.g., MA, MS, MEng, MEd, MSW, MBA)
- Higher than a master's degree (e.g., PhD, MD, JD)
- Prefer not to say

12. How long have you attended college while pursuing your undergraduate degree?

- 1 year or less
- 2 years
- 3 years
- 4 years
- 5 years or more
- I have graduated with my undergraduate degree
- Prefer not to say
## Coding rubric with code descriptions

### Table S1. New accommodations reported by students

| Code                                               | Description                                                                                                                                 |
|----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Additional extended testing time                   | An amount of time added to the current amount of time allotted on an exam allowed for the rest of the class.                                  |
| Flexible assignment deadlines                      | Students are allowed extended assignment deadlines.                                                                                         |
| Recorded lectures and class meetings               | Instructor records, either via video or audio recording, the class lecture and shares lecture recording with students.                      |
| Flexible class attendance                          | Student’s disability may occasionally impact the student’s ability to attend class, so flexible attendance allows the student disability-related absences. |
| Online note-taking services                        | Accommodation that provides students with the provision of materials in advance to facilitate the note-taking process, or by soliciting all the students who are registered in the course to find another student to take notes and share them with the student with a disability. |
| No exam lockdown browsers/cameras                   | Online proctored software not required for exam.                                                                                             |
| Closed-captioning of videos/lectures               | Online lectures are captioned in real-time by displaying the text of the speaker.                                                              |
| Option for cameras off during class                | Students are not required to keep cameras on during the class period.                                                                           |
| Reduced distraction home environment (e.g., earplugs) | Providing students with a space intended to minimize the distractions associated with testing.                                                   |
| Instructors share slides prior to class            | Instructor shares presentation slides before the class period.                                                                              |
| Work in smaller (breakout) groups                  | Students will work with one or two of their peers in a small breakout group.                                                                  |
| Use of clear masks by instructor                    | Clear masks safely make the instructors' mouths visible to students with disabilities.                                                        |
| Code                                               | Description                                                                                                                                 |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Flexible assignment deadlines                     | Students are allowed extended assignment deadlines.                                                                                     |
| Additional extended testing time                  | An amount of time added to the current amount of time allotted on an exam allowed for the rest of the class.                                |
| More frequent communication from instructors about expectations and due dates | Additional communication and announcements from instructors to remind students of assignment due dates and overall expectations for assignments. |
| No exam lockdown browsers/cameras                  | Online proctored software not required for exam.                                                                                         |
| Closed-captioning of videos and lectures           | Online lectures are captioned in real-time by displaying the text of the speaker.                                                         |
| Eliminating all timed assignments                 | Removing all timed assignments, assessments, and exams.                                                                                   |
| Open-book exams                                   | Allowing students to have access to their books or notes during exam periods                                                            |
| Flexible class attendance                         | Student’s disability may occasionally impact the student’s ability to attend class, so flexible attendance allows the student disability-related absences. |
| Online note-taking services                       | Accommodation that provides students with the provision of materials in advance to facilitate the note-taking process, or by soliciting all the students who are registered in the course to find another student to take notes and share them with the student with a disability. |
| Recorded lectures and class meetings              | Instructor records, either via video or audio recording, the class lecture and shares lecture recording with students.                 |
| Work in smaller breakout groups                   | Students will work with one or two of their peers in a small breakout group.                                                             |
| Option for cameras off during class | Students are not required to keep cameras on during the class period. |
|------------------------------------|----------------------------------------------------------------------|
| Reduced distraction home environment (e.g., earplugs) | Providing students with a space intended to minimize the distractions associated with testing. |
| Instructors share slides prior to class | Instructor shares presentation slides before the class period. |
| Socially distant testing centers on campus | Students could complete their exams from an on-campus, COVID safe, socially distant testing site to ensure a distraction-free exam environment. |
| Requests for printed materials | Providing students with printed materials (or facilitating with helping them with printer resources). |