

# Supplemental Material

*CBE—Life Sciences Education*

*Speer et al.*

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**Questions asked to all respondents, bold underlined text was not included in survey.**  
**Questions with \* required a response**

We're inviting you to take a survey for research on the effects of COVID-19 on the mentored research experiences of undergraduate researchers and their graduate student mentors. This survey is completely voluntary. There are no negative consequences if you don't want to take it and you may stop taking the survey at any time.

If you do choose to take the survey, you will be asked to answer multiple choice and free response questions about your research experience this semester. Answering the survey should take about 10 minutes. Completion and submission of your responses will be considered as showing your consent for your responses to be used in this research. If you do not submit the survey, your answers will not be recorded. Data collected is limited to your shared responses - we will not collect your email address, IP address, or other identifying information. Your individual answers will not be shared with your mentor/mentee, principle investigator, or department; however, de-identified aggregate data may be shared with other researchers.

If, after completing the survey, you would like to withdraw or alter a response you may contact Dr. Julia Johnson via email at [julia.johnson@wustl.edu](mailto:julia.johnson@wustl.edu).

I am over 18 or older and have read and agree to the above \*

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What is your mentoring experience? \*

- Graduate student mentor
  - Undergraduate student mentee
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If you are an undergraduate student, this semester are you:

- Enrolled for credit hours
  - Being paid
  - Other \_\_\_\_\_
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How are you currently communicating with your mentor/mentee and has it changed due to the COVID pandemic?

- Always primarily digital, this has not changed due to the COVID pandemic
  - Always primarily in-person, this has not changed due to the COVID pandemic
  - Changed from primarily in-person before the COVID pandemic to primarily digital now
  - Changed from primarily digital before the COVID pandemic to primarily in-person now
-

Since COVID-19 has impacted campus activities, what mode(s) of communication have you used to engage in mentorship? (select all that apply)

- In-person Meetings
- In-person Practical Training
- Email
- Text
- Video Conferencing (Zoom, Skype, Facetime, etc.)
- Phone Calls
- Digital workspaces (Slack, Microsoft Teams, WhatsApp, etc)
- Other \_\_\_\_\_

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How do you rate the following?

	Very good		Good		Bad		Very bad
Your relationship with your mentor/mentee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your communication with your mentor/mentee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The research productivity of your mentoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Since COVID-19 has altered how you communicate with your mentor/mentee, how do you rate the following?

	Very good		Good		Bad		Very bad
Your relationship with your mentor/mentee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your communication with your mentor/mentee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The research productivity of your mentoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Since COVID-19 has altered how you communicate with your mentor/mentee, how have the following changed?

	Much better		Better		Worse		Much worse
Your relationship with your mentor/mentee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Your communication with your mentor/mentee	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The research productivity of your mentoring	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**Questions asked to all graduate student mentors only**

At the beginning of this mentoring experience, what did you hope to gain from it?

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What were your specific goals in this mentoring experience?

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Have your goals changed due to the COVID pandemic? Why or why not?

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Have you accomplished your current goals? Why or why not?

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How has your mentee been contributing to your research during the COVID pandemic?

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**This question was only asked if respondent selected multiple forms of communication and only displayed selected answers**

You previously indicated that you have used the following modes of communication with your mentee. What has been the most useful?

- In-person Meetings
- In-person Practical Training
- Email
- Text
- Video Conferencing (Zoom, Skype, Facetime, etc.)
- Phone Calls
- Digital workspaces (Slack, Microsoft Teams, WhatsApp, etc)
- Other \_\_\_\_\_

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**This question displayed the selected response if only one form of communication was used**

Do you think that [\\${Q2/ChoiceGroup/SelectedChoicesTextEntry}](#) is a sufficient form of communication? Why or why not?

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How has using this form of communication helped you engage with your mentee during the COVID pandemic?

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What is the biggest barrier to mentoring during the COVID pandemic?

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What is the benefit of mentoring during the COVID pandemic?

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What has been the most unexpected effect of the COVID pandemic on your mentoring experience?

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Has this mentoring experience made you more or less likely to seek out further mentoring experiences?

- Much more likely
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- No change
- 
- Much less likely

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**Questions asked to all undergraduate student mentees only**

Aside from course credit or being paid, what were you hoping to gain from this undergraduate research experience?

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Did you accomplish this goal or has it changed due to the COVID pandemic?

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How has your research experience changed as a result of the COVID pandemic?

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**This question was only asked if respondent selected multiple forms of communication and only displayed selected answers**

You previously indicated that you have used the following modes of communication with your mentor. What has been the most useful?

- In-person Meetings
- In-person Practical Training
- Email
- Text
- Video Conferencing (Zoom, Skype, Facetime, etc.)
- Phone Calls
- Digital workspaces (Slack, Microsoft Teams, WhatsApp, etc)
- Other \_\_\_\_\_

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How has using this form of communication helped you engage with your mentor during the COVID pandemic?

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**This question displayed the selected response if only one form of communication was used**

Do you think that `#{Q2/ChoiceGroup/SelectedChoicesTextEntry}` is a sufficient form of communication? Why or why not?

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What has been the most unexpected effect of the COVID pandemic on your mentoring experience?

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What is the biggest barrier to receiving mentorship during the COVID pandemic?

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What is the biggest benefit of receiving mentorship during the COVID pandemic?

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Has this mentoring experience made you more or less likely to pursue a STEM career?

- Much more likely
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- No change
- 
- Much less likely

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**Questions asked to all respondents**

**In this section you will be asked to provide optional demographic information. Skipping this section will not impact the completeness of the survey. As a reminder, your individual answers will not be shared with your mentor/mentee, principal investigator, or department.**

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What is your first name? (Optional)

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What is your mentor's first name? (Optional)

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What is your mentee's first name? (Optional)

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What is your academic year? (Optional)

- 1
  - 2
  - 3
  - 4
  - 5
  - 6+
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What is your academic year? (Optional)

- Freshman (1st year)
  - Sophomore (2nd year)
  - Junior (3rd year)
  - Senior (4th year)
  - Other \_\_\_\_\_
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What is your program? (Optional)

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**End of Block: Block 3**

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Reasons undergraduates sought to engage in research during Spring 2020 (n=97)								
Learning the scientific process	Graduate skills	Practical experience	Specific project	Publication	Career	Thesis	Networking or mentoring	Independence
14	7	30	21	5	6	5	5	4
Were research goals changed due to COVID-19 during Spring 2020? Were research goals accomplished? (n=133)								
Changed	Not changed	Accomplished	Partially Accomplished	Not Accomplished	Wet lab work worsened	Dry lab work improved	Dry lab work worsened	Challenges working virtually
15	41	22	15	12	13	6	4	5
In what ways were research activities changed? (n=90)								
Focused on experimental design/theory	Focused on data analysis	Fewer tasks or canceled project	Work became menial or less productive	More meetings or communication	Focused on literature review	No change	Worse Communication	Became more productive
7	5	28	14	7	10	8	9	2
Most unexpected effect of COVID-19 on mentoring experience? (n=33)								
More work	Less connected to lab members	More connected to lab members	No/less research	More personal communication	New project	More literature based tasks		
4	9	5	11	2	1	1		
What were barriers to receiving mentorship during COVID-19? (n=52)								
Impersonal or reduced communication	Given poor or no direction	Time management	Less hands-on work or productivity					
23	8	3	18					
What were benefits to receiving mentorship during COVID-19? (n=45)								
Stayed productive or provided structure	No benefit	Mentoring on non-research topics	Better communication	Completed more data analysis	Gained a greater understanding of the field			
16	8	5	11	1	4			

<b>Reasons graduate students sought to provide mentorship during Spring 2020 (n=21)</b>								
Teach skills or techniques	Provide mentees a project	Gain mentoring skills or experience	Collect data or research experience					
4	2	8	7					
<b>Were research goals changed due to COVID-19 during Spring 2020? (n=27)</b>								
Changed	Unchanged	No experiments or data collection	Less contact or mentoring	Focused on other dry-lab work	Focused on career development			
5	6	6	4	5	1			
<b>Were research goals accomplished during Spring 2020? (n=29)</b>								
Yes	Partially	No	Goals were accomplished before COVID-19	Research halted or slowed	Too early to tell	Personality conflict with mentee		
5	7	4	3	8	1	1		
<b>In what ways have mentees been contributing to research during COVID-19? (n=14)</b>								
No Contribution	Data analysis	Experimental design	Increased communication					
5	5	2	2					
<b>What was the biggest benefit to mentoring during COVID-19? (n=11)</b>								
Improved communication	More time flexibility	Still paid and learning	No benefit	Theory discussion				
3	3	1	3	1				
<b>What was the most unexpected outcome of mentoring during COVID-19? (n=8)</b>								
Mentee mental health	Work stopped	More structure	Better Interpersonal relationships	Schedule change	Refocused work goals			
1	2	2	1	1	1			

