# Pandemic-Inspired Insights: What College Instructors Learned From Teaching When COVID-19 Began

**By Tessa Andrews and Kathryn Green**

*College instructors faced a rapid transition to remote instruction in spring 2020, and with it a host of new teaching challenges. This qualitative study investigates what 26 college biology instructors learned about students and teaching during this time. We used semi-structured interviews and content analysis to identify instructor learning that is relevant beyond the COVID-19 pandemic. Participants described two related insights about students: They became more aware that students' lives outside the classroom are complex, and they realized that their campus can act as a neutralizing space for students. Participants also reconsidered how they assess student learning. New realizations about students and teaching have the potential to impact teaching practices when in-person instruction resumes. Especially promising is an increased focus on students as individuals and the recognition that not all students experience life and courses in the same way. We relate findings to existing research and propose self-reflection questions that these findings raised for us.*

In the middle of spring 2020, the COVID-19 pandemic arrived in the United States. In response, institutions of higher education moved courses online, giving instructors days or maybe weeks to prepare. This created a novel teaching challenge for many instructors, who had to figure out how to provide remote instruction to students who scrambled to return home as campuses closed. There were international students and time zones to consider, technology issues to solve, and parameters dictated by institutions about remote instruction. Some instructors had previously taught online, but this was not online teaching. It was a rapid transition to remote instruction amidst tremendous uncertainty, change, and tragedy.

Though conditions were far from ideal, the rapid transition to remote teaching potentially created learning opportunities for college instructors. K–12 teachers have long been studied as learners who can continuously develop their teaching knowledge. For example, we know that unexpected moments can be powerful catalysts for teacher learning (e.g., Park & Oliver, 2008; Chan & Yung, 2015; Chan & Yung, 2018). Considerably less attention has been paid to college instructors and their learning, but they also need specialized knowledge to be effective teachers (e.g., Wagner et al., 2007; Speer & Wagner, 2009; Johnson & Larsen, 2012; Auerbach et al., 2018) and teaching experiences can contribute to knowledge development (e.g., Chan & Yung, 2018; Lutter et al., 2019). The rapid transition to remote instruction presented instructors with novel teaching challenges. Many instructors developed new lessons, teaching strategies, and assessments, and many learned one or more technologies. Did these circumstances prompt instructor learning?

## Purpose

Our goal in this exploratory, qualitative study was to characterize what college biology instructors learned from the rapid transition to remote instruction in spring 2020. We examined what instructors learned about students and teaching. We specifically highlight what instructors learned that had relevance beyond the COVID-19 pandemic and that represented a shift in their underlying thinking. For this, we drew on the concept of second-order change from organizational learning theory. Second-order change involves shifts in important thinking that underlies practices, whereas first-order change involves more minor adjustments to existing practices without shifts in underlying thinking (Kezar, 2014).

## Methods

### *Participants*

Our sample included 26 biology instructors from 11 institutions across the United States, including one pri-

vate and 10 public universities. All but one university was considered "R1: Very High Research Activity." Participants had taught undergraduate courses for a median of 20 (SD = 17) semesters and ranged in teaching experience from 1 to 66 semesters. The mean number of students in a course was 196 (SD = 162). All participants taught large undergraduate biology courses that rapidly transitioned to virtual instruction in spring 2020, with a mean class size of 196 (SD = 162) students. All participants used active-learning strategies when they taught in person. We asked participants what percentage of their position was dedicated to teaching. Slightly over half (n = 14) reported that 75% or more of their position was dedicated to teaching, and another eight reported 50% or more dedicated to teaching. More than half (58%) of participants identified as female. The majority (86%) identified as White, with a few participants identifying as Asian, Black, and Native American. All research was approved by the University of Georgia Institutional Review Board under protocol ID #00000297.

We interviewed instructors within a few weeks of the rapid transition to remote instruction when possible in order to learn about their experiences while they were still teaching. We were able to interview 85% ($n$ = 22) of the instructors during the spring semester and the other 15% ($n$ = 4) within one month of the semester's end.

## Data collection

We aimed to explore what instructors learned from rapidly transitioning to remote teaching at the beginning of the COVID-19 pandemic. We conducted semi-structured, virtual interviews lasting approximately 60 minutes, and offered a small incentive for participation. The full interview asked about the overall structure of instructors' remote course, details about a recent lesson, and what they learned from the rapid transition. This article focuses on participants' answers to three questions:

- Have you learned anything new about students as a result of remote teaching during spring 2020?
- Have you learned anything new about teaching (or yourself as a teacher) as a result of remote teaching during spring 2020?
- What have you learned from this experience that you would like to apply to your face-to-face instruction in the future?

Interviews were transcribed verbatim using Temi and checked for accuracy.

## Data analysis

Our goal was to identify and describe what participants reported learning about students and teaching during the rapid transition to remote instruction in spring 2020. Specifically, our analysis focused on what they learned that was potentially relevant to future in-person instruction and that represented a shift in their underlying thinking.

Our analysis included three main steps, each of which was iterative and collaborative. First, we familiarized ourselves with the data and developed an initial list of codes to identify and describe what participants reported learning. This involved reading transcripts, identifying the distinct ideas participants communicated, and developing codes to describe those ideas. Codes serve to group together quotes that convey similar ideas, and have both a name (e.g., "ideas about assessment, "students are multifaceted individuals") and description of the breadth of ideas encompassed by the code. Second, we comprehensively applied codes to all transcripts. We worked independently, and then reached consensus through discussion. Early in analysis, a code might apply to only a handful of quotes from participants. As more data were analyzed, however, we refined codes by fine-tuning code descriptions and combining and dividing codes as needed to comprehensively catalogue and describe the ideas communicated by participants. As codes were refined, we re-analyzed transcripts that had been previously analyzed. This continued until our codebook was finalized and all transcripts had been coded with the final codebook. We then read all of the quotes within each code as a final check and to inform impressions about larger themes among the codes.

Finally, we narrowed our list of codes to those with relevance beyond the COVID-19 pandemic. We identified codes that characterized ideas participants intended to transfer to future in-person instruction and that represented a substantial shift in how participants thought about students or teaching. This resulted in three main themes that we report in this article. We support each theme with quotes from participants, which have been lightly edited for clarity.

## Limitations

This article summarizes the insights of a modest sample of biology instructors who agreed to participate in an interview at a highly stressful time, and does not produce generalizable conclusions about what spring 2020 taught instructors. We cannot assume that instructors will

apply what they have learned to future teaching, nor can we assume that we captured everything instructors learned that will influence their future teaching. Some participants clearly stated that they intended to reflect after the semester ended. Interviews may have accessed what was most salient to instructors at the time, which may not be the same as what seems most salient when they teach in a subsequent semester. With these limitations in mind, we present the learning that participants described during or immediately following the rapid transition to remote instruction.

## Results

Even a few weeks into the rapid transition, 15 out of 26 participants described something they had learned that had relevance beyond the COVID-19 pandemic and represented a notable shift in their thinking. Importantly, all participants learned something from the rapid transition to remote instruction, including new technologies and teaching strategies, and new insights about themselves as teachers. Here we focus on instructor learning that has the potential to substantially shift how they think about their future in-person instruction. We observed three main themes of teacher learning. We support themes with quotes from participants. All quotes are represented with quotation marks; some are embedded in sentences and longer quotes are indented. Quotes have been edited lightly for clarity and grammar.

*Participants became more aware that students' lives outside the classroom are complex.* Teaching remotely caused some participants to pay more attention to their students' lives, including aspects of students' lives that are typically far removed from a college classroom. They learned that some students "don't come from really healthy families or have the healthiest space to learn." They realized that students have many "different pressures" and cannot necessarily be expected to "put in 60 hours a week into academic pursuits." Students shared with participants the various hardships they were experiencing, which helped participants to see students as not just learners, but also siblings, adult children, friends, earners, caretakers, and more. Students divulged that they were experiencing deaths in the family, multiple family members sick with COVID-19, parents needing help at their businesses after laying off workers, job loss, new responsibilities to care for siblings and other family, unreliable internet and sharing devices, friends having thoughts of suicide, and more.

This new vantage point on students' lives was not always limited to the participants themselves. One participant described how an experience in a virtual class helped some of her students realize that not everyone was home and safe every day. She explained:

"We had a check-in with the students. We just asked, 'How are you?' And the first 17 students said, 'I'm bored.' 'I'm bored.' 'I'm bored.' 'I'm bored.' The last student [said], 'I work at [a grocery store].' And so it was a completely different thing. This is a person actually working in the middle of [the pandemic], coming into contact with people...I think that it was interesting to me because the students, I don't think, process[ed] that anybody would be working or would be doing that. I think this has been enlightening for them to realize that their fellow students do have struggles and have lives that are more complicated [than they do]."

As a result of learning more about students' lives outside the classroom, some participants shifted their thinking about student behavior. This participant described a shift from feeling frustrated when students were not fully engaged in the course to wanting to be more attentive, understanding, and inclusive as an instructor, in recognition of the many challenges students face outside of school. She explained that teaching during a pandemic has made her want to remember, and even to remind colleagues, to avoid making assumptions about students' lives. She said:

"I have really no idea what's going on with those kids, their families, their living situation, their relatives. And just hearing 10% of those stories [about students' pandemic experiences] makes me pause... Just knowing some of the details of what they are going through gives me a different level of appreciation and…humbleness. [I want] to be more attentive and to be more understanding and inclusive…[hearing students' experiences during the pandemic] was eye-opening on many levels for me, even after all these years."

Another instructor explained that he typically aimed to treat all of his students the same, avoiding exceptions for only one student. However, he learned a lot about the trials students faced and realized that he did not want students to have to "give me like a whole backstory" or provide a "funeral program" when a family member dies. Instead, he felt it was

more reasonable to have a "no questions asked policy." He explained:

"And this time around I was like, any student that comes to me and says they're having problems… we'll accept the late work and I'm just going to tell them, 'do the best that you can, don't worry about it.'"

In a prior semester, this participant may have considered this policy too lenient and potentially unfair because it treated some students differently than others.

*Participants realized that their campus can act as a neutralizing space for students.* One specific insight that participants had about students' lives dealt with how campus may narrow the opportunity gaps among students. Once students returned home, some arrived in stable homes with adequate resources and time and space for learning. Others were in homes with "strife and conflict" that "they can actually get away from when they're on campus." Participants worried that these differences in home environment created gaps for students in their ability to engage and succeed in courses. One participant described this in detail:

"Everyone is experiencing the same thing before spring break. And then after spring break, some of my students went to homes where they had their own room. They had steady internet. They had parents who respected [what] the student was trying to do. They were fed on a regular basis. Parents continued to have jobs—ideal circumstances. And I think for those students learning online, they continued to maintain, or they rose to the occasion and online learning gave them greater opportunity to demonstrate what they were capable of. At the other end of the spectrum. I had students who went home to really dire circumstances. Parents lost jobs. They were tasked with taking care of their siblings. They were tasked with finding a job in the middle of a pandemic to support their families and do their schoolwork. Their mental health issues flared, any number of things. And for that group, I think I saw a dip [in their performance in the class]."

*Participants reconsidered how they assess student learning.* Most participants were accustomed to using in-class exams to assess student learning, and therefore were forced to try new approaches after the rapid transition to remote instruction. Some did away with high-stakes exams, instead opting for a greater number of lower-stakes assessments. Others wrote new kinds of questions for exams because they wanted to allow all students to use resources, such as a textbook or notes, and did not want students to be able to easily locate answers. Developing and deploying different types of assessments taught some instructors that "we don't have to do what we've always done."

As they reflected on the new assessments they had tried in spring 2020, some participants wanted to completely rethink the role that high-stakes assessments play in their courses going forward. They worried that existing approaches caused students undue anxiety. For example, one participant started to question a departmental policy requiring 80% of the grade to be based on midterms and a final, commenting:

"I really think that is harsh on the students. And I think they really would learn better if those other things, participation and completion and homework and discussion activities, would carry a little bit more weight."

Other instructors learned that their students could handle more challenging questions than they had anticipated and now they "no longer feel a fidelity to" closed-book exams with time limits. Instructors found that students moved beyond memorizing when faced with questions that required application and critical thinking. For example, a participant explained:

"I really learned that we could give introductory students a pretty high-level exam that's challenging, but at an appropriate level. I have first year students in this class and we got them to do some challenging things and think critically about some scientific articles, for example. And I learned that both they can do that and we can also write questions that allow them to go out and use resources and use new skills that are way beyond the classroom...I've been in this class for like 12 years now, [as a] teaching assistant and a faculty member and we've never done a non-traditional exam or an assessment where we had them go out and use all these resources and done something high level because it's an introductory class. I guess I've learned that we can, we probably should, be doing stuff like that."

Another participant discovered that he had greater access to what students were thinking when he asked different kinds of questions on quizzes. In spring 2020, he asked students to draw answers and also asked open-ended questions. He explained that, in

comparison, the multiple-choice questions he previously used did not allow him to gain any insight into "what's going on in their brains when they're answering."

## Discussion

The rapid transition to remote instruction in spring 2020 certainly was not ideal for expanding instructor knowledge about teaching and learning. Nonetheless, it created novel challenges and opportunities for college instructors, and some participants reported new insights about students and teaching that may serve them—and their students—beyond the pandemic. Here we situate our findings within the broader literature and describe questions these findings raise for us as college instructors.

One significant finding was that participants paid close attention to their students as people and, as a result, had new recognitions about how their course structure and policies may affect students differently. This is promising because learning about students as individuals, empathizing with them, and inquiring about how they experience the classroom are central to inclusive teaching (e.g., Marchesani & Adams, 1992; Dewsbury, 2020; Dewsbury & Brame, 2019). Combined with self-awareness that closely examines instructors' own social positioning, biases, assumptions, and privilege, knowledge about one's own students arms instructors to make decisions about the content taught, how it is taught, and course climate to better support all students in their learning and development (Marchesani & Adams, 1992; Dewsbury, 2020; Haynes & Patton, 2019).

The fact that some participants were just now recognizing the dramatically divergent circumstances their different students experience suggests that college instructors may lack important knowledge. In fact, when we sought feedback on these findings from student colleagues, they were taken aback by the lack of awareness some instructors seemed to have about their students. This caused us to reflect on how few opportunities instructors have to learn about students in large STEM courses. We were left thinking that the totality of managing large courses can desensitize instructors to students as individuals, and therefore stand as a barrier to inclusive teaching.

Importantly, there are effective strategies that instructors can use to learn about students as individuals, develop empathy, and place more prominence on student voices. Bryan Dewsbury authored a guide that curates and summarizes existing evidence about why and how to enact inclusive teaching (Dewsbury & Brame, 2019). As other examples, Killpack and Melón (2020) use first-day information sheets to learn about their students' lives, and Penner (2018) asks her students to work in groups on the first day of class to create classroom norms that can foster success for every student. Furthermore, Tanner (2013) provides a list of 21 strategies that can be used in large STEM classes to promote student engagement and cultivate classroom equity. Some of these strategies could be adopted tomorrow, such as asking (and waiting) for multiple students to raise their hand before calling on a student, and then hearing ideas from multiple students rather than just one.

A second finding of this work was that participants reconsidered how to assess student learning. Participants felt forced to ask exam questions that required more than memorizing information because students could easily access information during an online test. Assessment in introductory courses has often focused on memorizing information, rather than questions that ask students to apply concepts to novel scenarios, analyze and interpret data, or generate models and explanations (e.g., Momsen et al., 2010; Momsen et al., 2013). Yet, assessments that ask students to complete these more challenging tasks can result in students using more effective study strategies and developing better conceptual understanding (Stanger-Hall, 2012; Jensen et al., 2014). Asking questions that require students to construct explanations, drawings, or graphs have the added benefit of providing instructors with richer information about student thinking than can be gained from student answers to multiple-choice questions. Richer information about student thinking can help faculty develop knowledge of common student difficulties (i.e., pedagogical content knowledge), which can then inform instructional decisions about teaching specific concepts (e.g., Andrews et al., 2019).

Other participants began to worry more about the anxiety students experience with high-stakes assessments. Similar to getting to know students as individuals, this may also relate to equity in science courses. Female students in biology report more test anxiety than their male counterparts and anxiety predicts exam performance (Harris et al., 2019; Cotner et al., 2020). Forced to innovate, some participants tried more frequent, lower-stakes assessments. If instructors continue this practice, future research can investigate student anxiety, learning, and performance, and how this differs for students of different social identities.

The findings in this paper suggest self-reflection questions that we are asking ourselves as instructors. What new insights did we have about our students' lives during the pandemic?

What allowed us to have these insights? Was it the shared experience of a global pandemic, new ways of interacting with students, students feeling empowered to share their hardships, or something else? What do we want to remember about students and their lives, even after we return to more typical teaching circumstances? What approaches could we integrate into in-person instruction to help us empathize with students' experiences? What assumptions am I making about the assessments my students are capable of completing?

As a participant stated, teaching in spring 2020 helped instructors see that "we don't have to do what we've always done." Trying new things in teaching is hard. It takes time and a willingness to fail (Andrews & Lemons, 2015). The rapid and dramatic instructional shifts in 2020 were stressful and demanding for instructors and students, but also forced us to interact and teach in ways we may never have otherwise tried. It is tremendously promising that participants started questioning their assumptions about students and teaching as a result of these experiences. We encourage researchers and professionals who support college instructors to think about how we can leverage instructors' pandemic-inspired insights to expand the use of inclusive teaching practices in college classrooms. ☒

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