

Online Science Teacher Preparation and Nontraditional Recruitment: New Strategies for Addressing the STEM Teacher Shortage?

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With the COVID-19 pandemic forcing us to provide science instruction and science teacher preparation through online learning environments, we were collectively called upon to invent effective strategies for the online space. We were forced into an arena in which we had often been skeptical and maybe even critical of the level of effectiveness for science education and, even more, science teacher preparation. Now, a general assumption across many educational spaces is that such pressure gave rise to many creative and effective strategies that would not have been conceptualized if the pandemic had not happened, and perhaps many such strategies should stick around. There are lessons to be learned and shared from those creative methods that we developed over the past 2 years, as evidenced by two of the four articles in this issue that focus on elements of science teacher education that occurred online or in a virtual space. In this editorial, we discuss whether our lessons learned from the pandemic regarding science teacher preparation, combined with a reconceptualization of who should be teaching science, can be applied to address the worsening shortage of science teachers. Might we view this newly realized tool more positively, and if used judiciously in combination with other creative ideas, might it help to alleviate one of the most longstanding issues confronting science education—the national science teacher shortage?

Even prior to the pandemic, science teacher shortages have been ever-present across nearly every state in the United States, especially in high-need settings (U.S. Department of Education, 2017). The problem of teacher shortages has worsened due to the pandemic, and this remains true for science teachers. Traditionally, the teacher shortage has been blamed on three factors: insufficient numbers of fully qualified teacher applicants, depressed salary and benefits compared to other STEM careers, and fewer high school graduates pursuing teaching careers (Buttner, 2021). However, the recent *Illinois Educator Shortage Study* (IARSS Educator Shortage Committee et al., 2020) indicates that other factors may be at play. For example, 53% of districts participating in this study reported geographic location as detrimental to their ability to recruit educators (p. 7). The same study found that in 2020, 257 classes were canceled and 195 were moved online due to teacher shortages (p. 3). The study calls upon state educational agencies to explore hybrid, remote, and competency-based models for teacher preparation in order to prepare more teachers as well as preparing teachers to deliver courses through such methods, recognizing that these iterations of online learning will likely not be disappearing soon.

Indeed, if we are able to prepare science teachers to effectively facilitate science learning through these pedagogies, the issue of geographic location could potentially be alleviated. Yet, this does not solve the numbers problem. The shortage in the number of teachers is in large part due to teacher recruitment only being effective for one demographic—White women. Seventy-nine percent of our country’s teachers are White, and 76% are women (National Center for Education Statistics, 2021, pp. 1–2). Even in science disciplines that are heavily dominated by men, White women in the teaching profession for that discipline are disproportionately higher. For example, only 20% of physics majors are women (Blue et al., 2018, p. 42), whereas high school physics teachers are 43% women and 93% White (Banilower, 2019, p. 3). Along with this being a problem of representation and diversity in STEM science teaching, it also means that we have an untapped pool of eligible science teacher candidates, specifically Black and Latinx undergraduates, who could not only effectively address shortages but also reverse the devastating impacts on our collective inability to achieve representation due to lack of role models and culturally responsive STEM instruction. Our disciplines need the contributions and innovations that would be put forth by these untapped populations, and the novel and creative innovations that came out of the pandemic might better enable us to support their entry into the profession.

We are all getting a bit tired of hearing about the lessons that we can learn from pandemic teaching, and we have a desire to “just go back to normal.” However, that is unlikely to occur. We are called upon to extract the effective strategies that were developed during that time of crisis and continue to iteratively build on them. Further, we continue to be called upon to solve the problems that were present before the pandemic, such as underrepresentation in STEM and the science teacher shortage. The pandemic provided us with sparks of insight that can be developed into real solutions. If you did creative and innovative things in a virtual space, particularly if you found them to be effective in recruiting untapped populations of teacher candidates, *Innovations* is the ideal place to share them. So, please submit an article! Together, our successes and lessons from pandemic teaching can help us craft solutions to reach untapped populations of teacher candidates, finding effective and supportive means to fill a need for science teachers and diversify the science teaching population.

To address this need, we need to work to change the view of teaching, especially K–12 teaching, as “women’s work” so that men and boys can envision themselves teaching. Regarding this, the pandemic has provided a spark of innovation to seize if we are willing. National Guard troops being called in to serve as substitutes (Green, 2022) or asked to help in classrooms during the pandemic shortages has led to new careers (Wood, 2022). The pandemic has given some new and different populations a chance to be in the classroom and possibly see themselves as educators. Can we help train them and keep them there?

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