

Teachers as Students: Adapting to Online Methods of Instruction and Assessment in the Age of COVID-19

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ABSTRACT

All across the nation, school districts were announcing what many educators were expecting; schools would close their doors to traditional instruction in light of the COVID-19 pandemic. Suddenly, many teachers found themselves in the precarious position of redesigning previously developed face-to-face lessons, to ones that could be delivered from one computer screen to another. The uncertainty of how to suddenly deliver instruction online to diverse learners posed a challenge to virtually all science and mathematics educators and teachers were faced with the daunting task of transitioning from familiar in-person pedagogical practices to ones that relied on technological proficiency, creative methods of assessment, and underutilized pedagogies of care. The purpose of this article is to describe my personal experiences with online teaching during school closures as a result of the COVID-19 pandemic. Additionally, this article will describe the ways in which I adapted my instruction, assessment, and approach to diverse students to meet their needs in the remote secondary science classroom.

Introduction

March 2020 was an unprecedented month for education. All across the nation, school districts were announcing what many educators were expecting; schools would close their doors to traditional instruction in light of the COVID-19 pandemic. Of course, many districts began school closures “softly” only anticipating a duration of two to three weeks. However, what was once expected to last two to three weeks, became the new normal for the rest of the school year. Districts across the nation either decided to end the school year early, or continue the school year until the end by delivering remote instruction to students, as best as possible.

Suddenly, many teachers found themselves in the precarious position of redesigning previously developed face-to-face lessons, to ones that could be delivered from one computer screen to another. Pedagogical decisions revolving around the promotion of equity, development of academic vocabulary in social contexts, and the integration of three-dimensional science and mathematics learning were cast aside for lessons that could be understood and conducted remotely by the wide variety of diverse learners in the online classroom.

The uncertainty of how to suddenly deliver instruction online to diverse learners posed a challenge to virtually all science and mathematics educators. As a secondary science educator, I have faced my own personal challenges transitioning to the online classroom, but have undoubtedly gained many lessons related to the demand of effective remote instruction. Indeed, the COVID-19 pandemic posed educators in a unique position as students themselves; students of online teaching.

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in which I adapted my instruction, assessment, and approach to diverse students to meet their needs in the remote secondary science classroom.

Technology

The realization that schools would be forced to remain closed as a result of government “safer at home” orders suddenly brought a surge in demand for technological teaching tools that would aid with the new distance learning models being adopted in school districts across the country. As an educator, my email inbox was suddenly flooded with messages of support and promotion of tools such as ExploreLearning® Gizmos® and STEMscopes™. The message was clear, that regardless of comfort level, teachers had no choice but to plunge head-first into the pool of technology. Some teachers were already comfortable with the use of technology, while others rarely used online teaching tools to direct student learning in the traditional face-to-face classroom. Regardless, technology was to become the savior of the sudden transition to online schooling as a result of the COVID-19 pandemic.

Though I was moderately comfortable with the use of technology in the secondary science classroom, I knew that I would quickly have to come up with novel applications of readily available technology to enable my diverse learners to effectively meet the learning objectives of the presented content. I was fortunate because I was already aware of the multitude of possibilities for instruction that the ubiquitous PowerPoint software provided to me. With careful and strategic planning, I became skilled and proficient at developing self-paced learning modules that allowed my diverse science learners to engage with the disciplinary content in a way that was scaffolded, supportive, and most importantly remote. I planned modules that relied on push-button navigations to aid students with spanning the content, formative assessments that ensured that students were meeting learning objectives before moving to new content, and summative assessments that could be completed directly in Google Forms and be automatically scored. I did not need fancy instructional design software or special skills, but rather a few YouTube tutorials and the omnipresent PowerPoint to create a remote learning experience that still addressed the needs of diverse learners while also meeting the disciplinary content objectives of the course. Indeed, my students enjoyed the self-paced structure of these learning modules and expressed a sense of achievement by successfully navigating the module to the end.

While the development of self-paced PowerPoint instructional modules is useful for teaching students small chunks of new content and reinforcing previously learned material, I also sought technological tools that could be used to further develop students’ proficiency in the Science and Engineering Practices (SEPs) of the Next Generation Science Standards (NGSS Lead States, 2013). The Concord Consortium provided an online platform for STEM learning resources and modules that promoted online learning experiences that engaged students with such SEPs as collecting and analyzing data, using models, and engaging in argument from evidence. As my school site has adopted the three-course model to infuse the Earth and Space Science (ESS) standards of the NGSS into the disciplinary content of secondary biology, chemistry, and physics, I was specifically drawn to The Concord Consortium’s High-Adventure Science modules (HAS) as these modules directly targeted student learning in ESS. The modules provide students with a moderately rigorous, self-paced, guided approach to science inquiry while also ensuring ample opportunities for students to engage with the SEPs, primarily data analysis and model-use as a means to understand complex scientific phenomena. Furthermore, the HAS modules not only provide students with a learning experience that effectively incorporates the NGSS, but also provide teachers with a streamlined approach to assess students. Student responses are automatically saved on The Concord Consortium’s internet page such that teachers can readily track student progress and student responses remotely.

Academic Integrity

The above instructional strategies effectively promote the learning of diverse students in online contexts. However, a significant obstacle to the best efforts of many STEM educators redesigning instruction for online platforms is that of academic integrity. As technology is a valuable tool for ensuring the continuation of remote student learning, so too is it a significant detriment to authentic learning for students tempted to cross the lines of academic integrity. The Google suite of applications enables students to share responses with each other, and focused internet browsing attempts can be easily circumvented by students with the use of a second personal device. With this in mind, fairly assessing student learning in online contexts has become challenging for all teachers, irrespective of discipline. Due to this challenge, creatively assessing students has become paramount for teachers shifting to online methods of instruction.

Traditional multiple choice and short answer assessments, while used in many classrooms across the country, are no longer reliable for assessing authentic student learning in online contexts. Instead, alternative assessments such as remote group collaborations, video recordings, and even photographs can be used to effectively assess students' disciplinary content knowledge. For example, a culminating assessment that can effectively assess students' knowledge of the ESS of the NGSS requires students to research an alternative form of energy and summarize the benefits and hindrances of this alternative form of energy in a video presentation. The parameters of this culminating assessment can be tailored to ensure that students are in fact demonstrating the expected learning outcomes of the unit, and furthermore these parameters can be assessed holistically in one video presentation or in sequential video presentations. For example, students might be required to record short videos that demonstrate specific unit objectives on platforms that are familiar to students such as TikTok. Embracing technology that is popular amongst students, such as TikTok, encourages student participation and creativity while demonstrating their knowledge and provides the teacher with a summative assessment strategy that mitigates issues with academic integrity. Alternatively assessing students using video presentation strategies mitigates the likelihood of academic integrity breaches, while still remotely ensuring student learning accountability.

Kindness

Thus far, the focus of this article has been on instructional and assessment strategies that have been successful during the transition to online learning contexts in light of the COVID-19 pandemic. Aside from the logistics of instruction and assessment that have posed significant challenges for many educators, teachers must remember to promote a "humans first" approach to instruction and assessment, particularly during the challenging times of COVID-19. A "human first" approach to instruction and assessment sets the stage for online learning experiences that are supportive and flexible during the uncertainty that COVID-19 presents. This approach to instruction encompasses what Nel Noddings (1995) refers to as a pedagogy of care. A pedagogy of care ensures that students know that they are cared for through acts of nurturing, compassion, and kindness. A pedagogy of care is paramount particularly in the era of COVID-19 as students may undoubtedly be facing illness, death, poverty and more, because of the domino effects of the pandemic. With so many students facing the cancellation of coming-of-age events such as prom, graduation, and other culminating ceremonies, kindness and understanding form the basis of all pedagogical decisions in my online classroom.

A pedagogy of care can take many forms, but in the online classroom several features surface. The two most prominent features of a pedagogy of care in my online classroom are connection and flexibility. Connection is achieved by being available to my students both synchronously and asynchronously. Conducting synchronous class meetings twice a week provides both me and my students with a chance to connect, share experiences, and reflect on the challenges of online learning

together. Additionally, connecting in this way ensures that students know that both myself and their classmates are still in this together and that while we may be isolated physically our shared experiences online as a class group still unite us. This connection also serves to mitigate the isolation that students feel and the resultant lack of motivation for online learning that may overshadow student efforts to continue engaging with online learning platforms. Asynchronous connection is achieved through the use of the Remind app that allows my students and I to “text” each other during school hours, while still concealing personal cell phone numbers. Being available in this way has helped my students remain connected to me as their teacher so that they can ask quick questions, or even just to say “hi.”

Flexibility is also an important component of the pedagogy of care that I enact in my online classroom. Recently, a student shared that both of her parents were laid off and as a result she had to find work in a local grocery store to continue supporting her family. Her newfound reality resulted in her having profound difficulty managing the emotional toll of her family’s financial struggles, her new financial responsibilities, and her obligations to her schooling. Together, she and I worked out a plan to help her stay on track with the learning material of the course while not being adversely affected by her inability to meet deadlines and participate in synchronous class meetings. My flexibility ensured her continued success in my online class and also provided her with some much needed support during the uncertainty of the pandemic.

Conclusion

The COVID-19 pandemic created unprecedented challenges in education for a multitude of stakeholders, including teachers and students. Teachers were faced with the daunting task of transitioning from familiar in-person pedagogical practices to ones that relied on technological proficiency, creative methods of assessment, and underutilized pedagogies of care. Though the COVID-19 pandemic presented challenges for educators across the nation, many educators heeded the call to adapt their methods of instruction and assessment to accommodate the shift to remote schooling. Indeed, the COVID-19 pandemic presented an opportunity for tremendous learning and growth for educators, such that teachers also became students in the online classroom.

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