# COVID-19: Impact on STEM Students and Educators

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In 2020, the world turned upside down for educators and students. The new way of remote learning posed a problem, especially for educators in STEM. They had to adjust and find ways to make their learning materials more hands on and tangible that were like teaching in-person. However, transitioning to online classes caused some discussion gaps that divided educators and students. There was less collaboration between students which affected students' motivation to learn adversely. [1] Students were not willing to take the time to collaborate online as it was found to be more tedious.

As some STEM educators prepared less work for their students for remote learning, other STEM educators took this challenge head on. One of these educators was Mrs. Sharita Ware, the 2022 Indiana Teacher of the Year. Fortunately, her school did not shut down completely during the pandemic. At that time, she did everything she could to make sure that her students learned in the safest way possible while giving her students the full experience of a STEM class. However, there were several roadblocks in the way of achieving this full experience.
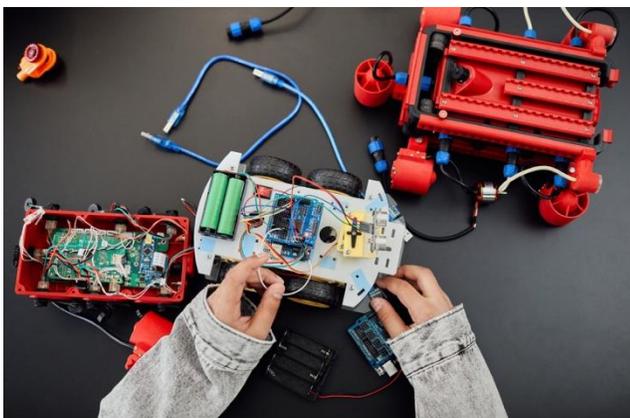
Source: Canva stock image

Roadblocks in STEM Teaching

For in-person classes, safety precautions had to be implemented to prevent the transmission of COVID. Time had to be accounted for to disinfect machines and sanitize all tools that would be touched. As an added precaution to prevent transmission of the virus, personal protective equipment (PPE) had to be put on which took time away from teaching lessons. [2] One of the solutions to mitigate this safety concern was to provide students with previously obtained data to eliminate touching equipment. This took away from the real-life experience and the thrill of gathering data on one's own. In the same token, in a normal environment, the technology and equipment used to obtain data from in-class experiments was provided by schools at no cost to students. However, that same equipment would cost more for online classes which could be unaffordable for many households. The loss of collaboration between students, and the added cost of equipment may be a deterrent for students to pursue their STEM passion.

In addition, the students found it more challenging to achieve their full potential. Students who did not fail before were suddenly experiencing it and did not know how to handle it. Seeing how failures could be taken as a taboo in academics, Mrs. Sharita Ware allowed her students to make mistakes so that they could learn and grow from them instead of having defined objectives that restricted her students from growing. She states that "there's value in failing" which students do not realize especially at a younger age. [3] These students need to be constantly reminded of their successes and their capabilities especially during a pandemic.

Distractions were another roadblock that contributed to the inability of the students to achieve their full potential to learn. Mrs. Sharita Ware, in her keynote lecture at Honors Hall, stated that technology and phones have distracted students from full engagement in their classes. Not only do their devices provide an extra distraction during online classes, but it also negatively affects their performance in school, whether it be remote or in-person, as students tend to use their devices late at night. Parents contributed to this problem as they did not supervise their children when it came to technology which caused learning difficulties in the classroom. Altogether, COVID posed many roadblocks that affected students' performance in classes.

Experiences: Then and Now

Inevitably, because of COVID, STEM experiences in high school for students who are currently in college have differed from high schoolers now. For instance, STEM educators during COVID had to present their equipment through a screen where students could not have the hands-on experience. The quality of the camera presented by the educator was a problem as the fine details of what the equipment could do was not fully observed through a screen. Pre-COVID, this was not a problem as the equipment was right in front of each student and educators could take time to properly perform and handle the equipment live. Furthermore, during and after COVID, parents state that their children have spent less time on activities and assignments during remote learning than ever before. [4] This poses a problem as educators have noticed the difficulty their students are having at retaining information as they adjust back to in-person learning.

As more classes transition back to in-person, STEM educators must adjust their teaching styles to accommodate the effects of COVID to their student's motivation, learning styles, and possible regression from learning. COVID has affected the way students have learned and how they will learn moving forward – these ill effects of COVID in STEM learning will have to be undone.

NOTES

[1] Sarah D. Sparks, "Science teaching and Learning Found to Fall Off in Pandemic," Education Week, April 12, 2021, https://www.edweek.org/teaching-learning/science-teaching-and-learning-found-to-fall-off-in-pandemic/2021/04

[2] James Palcik, Teaching STEM During COVID," The Journal, September 18, 2020, https://thejournal.com/articles/2020/09/18/teaching-stem-during-covid.aspx

[3] Zoe Replinger, "Carrying the torch: Q&A with Sharita Ware, 2022 Indiana Teacher of the Year," Purdue University, February 10, 2022, https://stories.purdue.edu/carrying-the-torch-qa-with-sharita-ware-2022-indiana-teacher-of-the-year/

[4] "Online Education in STEM and Impact of COVID-19," Science & Engineering Indicators, accessed April 18, 2022, https://ncses.nsf.gov/pubs/nsb20211/online-education-in-stem-and-impact-of-covid-19