What did we do Right? Reflections on Web-programming Labs and Students' Engagement During COVID-19 Pandemic

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ABSTRACT

This paper documents my personal reflections on how web programming lab module was adapted to online learning and asynchronous delivery.

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Getting students engaged in programming (coding) activities could be tricky and time-consuming, particularly for first-year undergraduates. As a module leader in this domain, I felt additional moral responsibility for introducing programming to the students in a way that inspires continued interest in coding, because first impression of coding often frames students' journey and long-term career decisions. This assertion draws on my 12-year Information Technology industry practice and interactions with entry-level programmers over the years.

Pre-COVID-19, the students attended two-hour weekly lab sessions, they used lab manuals to complete the lab tasks. In the process, I offered head-over-shoulder physical support to struggling students. At the end of the labs, students were assessed through viva sessions. On the other hand, during COVID-19, teaching and lab activities moved online. It was not as straightforward as it sounds, it was even more tenuous because mental stress was high, attention span appeared low, and there was increased reliance on digital technologies with associated steep learning curves. In this situation, with some degree of anxiety, I explored different teaching and learning approaches to stimulate students' engagement.

At the end of the cohort, I reflected on how I navigated the module delivery, and I summarized the transition in *Figure 1*, highlighting key teaching and learning approaches.

Consequently, the exploratory adaptation of the module to online asynchronous delivery revealed the following practices that worked and got students engaged despite the challenges of the pandemic
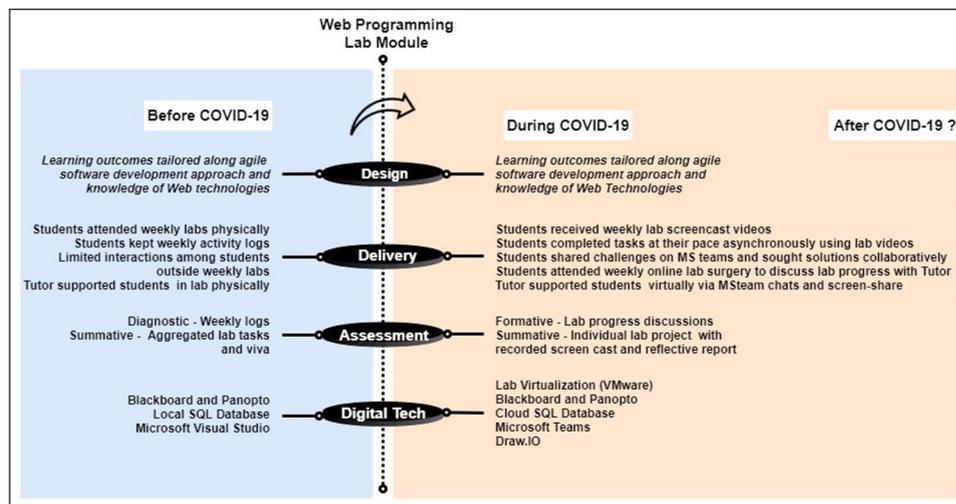

Figure 1 Web programming lab module transition to online delivery.

- **Cloud and lab virtualization using VMWare:** The virtualization allowed students to *import* the University labs into their personal computers with all required software pre-installed. The cloud database made it possible for all students to work synchronously in the same database environment and I could monitor all activities remotely.
- **Video recorded lab guide:** Using narrative screencast video of the lab activities, students completed the lab task at their pace, and convenience. Most students found the conventional lab manuals uninteresting and difficult to follow compared to the screencast.
- **Weekly online surgery sessions:** Two-hour weekly lab-time was converted to surgery sessions where students shared their progress individually, problems and bugs were resolved using MS-Teams screenshare and remote user-screen control functionalities.
- **An open approach to coursework:** Students were required to develop a 5-page personal website with specific functionalities. This coursework gave room for creativity as students created personal websites for diverse types of people, across cultures, careers, hobbies, etc. The principle of website creation applied was the same, but the outputs were different. Moreover, students had the privilege of reflecting on the process of creating websites and they documented their challenges and how they were resolved.

No doubt, the COVID-19 pandemic period was a challenging time, but it taught me resilience and flexible ways of engaging students, particularly in hands-on modules such as programming. Students had their best creative moments. Now, I feel more equipped, and I look forward to my next programming labs with or without COVID-19.

COMPETING INTERESTS

The author has no competing interests to declare.

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