COVID-19, students and the new education landscape.

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COVID-19, Students and the New Educational Landscape

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ABSTRACT

Students have experienced incredible shifts in the in their learning environments, brought about by the response of universities to the ever-changing public health mandates driven by waves and stages of the coronavirus pandemic (COVID-19). Initially, these shifts in learning (mode of course delivery, course availability, etc.) were considered emergency responses. However, as the pandemic presses on, students have had to repeatedly adapt to the continuously evolving educational landscape as this global health crisis forced an "unprecedented global shift within higher education in the ways that we communicate with and educate students" [3].

This working group builds upon foundations and structure created by a 2021 ITICSE Working Group exploring the effects of COVID-19 on teaching and learning from a faculty perspective. That Working Group identified the incorporation of some pandemic-induced changes into future teaching practices [2, 3]. In this Working Group, we explore existing literature regarding the student experience in response to the evolving teaching practices catalyzed by COVID-19).

Traditionally, computing is a subject full of experiential learning opportunities, rich with in-person labs and exercises. We explore how the changes within the COVID-affected academic landscape have altered that student experience. The current group of computing students will have had experiences under both typical (i.e. pre-pandemic) and COVID-affected teaching practices. It is, therefore, timely that we understand how each has impacted how they perceive their learning environment and educational experience. In turn, identifying those practices that have most benefited the

student learning experience will help computing faculty improve their practices going forward.

CCS CONCEPTS

• **Social and professional topics** → **Computing education**.

KEYWORDS

COVID-19; coronavirus; computing education; online education; student perspective

1 BACKGROUND

The move into higher education is always a pivotal and formative experience for students as they transition into this new educational landscape [1, 5–7]. Since the beginning of the COVID-19 pandemic, students have been confronted by significant shifts in educational practices and expectations. As provisions were put into place to facilitate both online and in-person teaching, students were thrust into a largely new and constantly changing learning environment, very different than the environment experienced by the students that came before them. These changes and challenges were largely present for the totality of the 2020-21 and 2021-22 academic years. Thus, over the last two years, subjects which traditionally benefit from "in-person" activities such as guided labs, experiential learning activities and tutorials have transitioned into online and/or blended learning environments through the use of various technologies and innovative pedagogies.

It is imperative to remember that these pandemic-affected students have had to unexpectedly and rapidly adapt to unprecedented, and often newly-created, online and blended learning situations [8]. It is important to capture the student experiences in this moment,

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as this set of students is unique in that they will have experiences under both typical (i.e. pre-pandemic) and COVID-affected teaching practices.

These pandemic practices may have provided some challenges for student learning, but there were also silver linings as they sparked some new and creative modes of engagement in higher education. Evaluation of and exposure to new tools and learning techniques took place at a faster rate than ever before [4]. While the experiences remain fresh, it is important that we capture the lessons learned from students so that we can incorporate them into our future practice.

The aims of this working group are:

(1) To better understand the impact of COVID-19 on computer science students in a multinational context. Educational practices impacting the student experiences that will be explored will include tools, delivery methods and techniques (student engagement and teaching practices) employed throughout the pandemic;
(2) To explore the results of the study to understand best practices and learning resulting from changes taken in response to COVID-19;
(3) To share the results with the wider computer science education community.

2 METHOD

There are two main streams of work which will be carried out in parallel:

The first is a literature review. Whilst we anticipate that in many ways this will build upon the existing work carried out for our previous pandemic-related Working Group ([2, 3]), it is important to ensure that the literature review is updated with any work that has been published since that study, and that it encompasses student perspective as a key theme.

The second is a multinational survey that aims to understand how the student learning experience was impacted during the pandemic. All university-level students who are studying under the umbrella term 'computing' will be eligible to participate. The survey is currently expected to be circulated at each of the authors' institutions and to other computing educators via existing networks and mailing lists, and the subsequent analysis will form the majority of the discussion in the full paper due for publication later this year.

2.1 Key Themes

The following key themes will be explored through Likert-scale questions and free-text options:

Mode of delivery: How has your learning been delivered? What is your experience with online, blended and hybrid learning?

Strategies for adapting to learning: What new technology have you been exposed to? How have you used and evolved your study skills to cope with this new (and at times, unexpected) way of learning?

Mental health and personal wellbeing: How have you perceived your mental health throughout the pandemic?

Reliance on support: What was your reliance on support, including instructors? Did you develop meaningful communities of practice?

Preferred learning tools: What learning tools would you like to see used going forward?

Preferred practices, approaches and innovations: What 'emergency' practices, or innovations to teaching and learning approaches would you like to see retained in a post-pandemic setting?

Vision for the future: What do you feel your future educational experience should look like?

3 OBJECTIVES

While it is expected that the makeup of the working group members and member institutions will shape the final study focus, the following research questions will function as a guide for the membership:

- What new and/or adopted pedagogies employed through the pandemic have been beneficial for students?
- How have students maintained engagement with each other through teaching and community building?

In the broadest sense, our motivation is to explore what we can learn about the impacts that COVID has had on the overall student experience in computing education and how this will shape student expectations moving forward.

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