

Editorial for Special Issue on Research on Supporting Remote Teaching and Learning during the COVID-19 Pandemic

Chung Kwan Lo ^{1,*}  and Khe Foon Hew ²

¹ Department of Mathematics and Information Technology, The Education University of Hong Kong, Hong Kong SAR 999077, China

² Faculty of Education, The University of Hong Kong, Hong Kong SAR 999077, China; kfhw@hku.hk

* Correspondence: chungkwanlo@eduhk.hk

1. Introduction

The global outbreak of COVID-19 profoundly altered our lives and teaching practices. In response to the control policies introduced as a result of the pandemic, schools and universities in many parts of the world were forced to close and conduct instructional activities entirely online [1]. Although the use of educational technology has been advancing for decades, this was the first time that many teachers taught in a fully online environment, as well as the first time that students had to learn entirely remotely through the Internet. Thus, many teachers and students were ill-prepared for the challenges posed by online learning [2], and they might search for guidelines to inform future teaching and learning activities. Therefore, this Special Issue aims to elicit submissions of empirical studies that evaluated the efficacy of online instructions, revealed the voices of teachers and students, and, most importantly, had significant pedagogical implications for instructional improvement.

2. Overview of the Papers Contributed to This Special Issue

This Special Issue comprises 10 articles. Based on their research objectives, these articles can be classified into three major categories as follows.

2.1. Impact of Online Teaching and Learning during the COVID-19 Pandemic

In “Online Mathematics Education during the COVID-19 Pandemic: Didactic Strategies, Educational Resources, and Educational Contexts,” Videla et al. examined the impact of the COVID-19 pandemic on online mathematics education in Chilean primary schools. Through a survey of 105 educators, they explored the didactic strategies and educational resources used during remote teaching. Their findings highlighted the relationship between teachers’ technical knowledge, experience, and their chosen teaching strategies, as well as the differences between rural and urban educators. The study provided recommendations for enhancing mathematics teacher training and pedagogical skills in online environments, emphasizing the importance of metacognition and virtual forums.

In “Mathematics Lecturers’ Views on the Student Experience of Emergency Remote Teaching Due to COVID-19,” Ní Fhloinn and Fitzmaurice investigated mathematics lecturers’ perspectives on the student experience of emergency remote teaching during the pandemic in higher education. Survey responses from 257 lecturers across 29 countries revealed the challenges faced by students, including hardware/software issues, childcare constraints, and personal circumstances. Lecturers reported lower engagement in online learning compared to in-person lectures, but they still maintained regular contact with students. The study provided a global perspective on the student experience during the pandemic from the lecturers’ perspectives.



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2.2. Pedagogical Approaches and Strategies in Online Education

In “Enriching Traditional Higher STEM Education with Online Teaching and Learning Practices: Students’ Perspective,” Skliarova et al. investigated the benefits and challenges of online teaching and learning practices within STEM courses in higher education. Through a questionnaire administered to 167 STEM students, the study identified effective practices, common obstacles, and areas for improvement. Their findings emphasized the need for teacher preparation, addressing technical limitations, improving communication, and enhancing student engagement for more rewarding teaching and learning experiences.

In “Teachers’ Appreciation of Benefits and Shortcomings of Online and Blended Higher STEM Education,” Skliarova et al. continued to investigate online teaching strategies suitable for blended and face-to-face higher STEM education. Through an online questionnaire administered to the STEM faculty at the University of Aveiro, Portugal, the study identified skills and competences gained during the pandemic and provided recommendations for integrating them into traditional and blended courses. The findings were compared to students’ perspectives, highlighting similarities and discrepancies, and contributed to enhancing online STEM education outcomes.

In “Collaborative Learning: A Design Challenge for Teachers,” Pozzi et al. examined how teachers design collaborative learning activities in different learning settings, including face-to-face, blended, and fully online environments. Based on a self-reported survey of 268 Italian teachers, their findings revealed that collaborative learning activities were proposed to some extent across settings, but there were significant differences in approaches and tools used. However, the study also highlighted that some teachers’ design decisions did not align with recommendations from the collaborative learning research community.

In “Do Direct and Indirect Recommendations Facilitate Students’ Self-Regulated Learning in Flipped Classroom Online Activities? Findings from Two Studies,” Du et al. investigated the impact of direct and indirect recommendations on students’ self-regulated learning (SRL) skills, course engagement, and learning performance in flipped classroom online activities. Their findings suggested that direct recommendations improved engagement and motivation for SRL, while indirect recommendations served as reminders for students to self-regulate their learning. Both types of recommendations had a significant effect on the quality of students’ online learning. Implications for future research were discussed.

2.3. Remote Teaching and Learning in Specific Domains

In “The Use of Open Educational Resources during the COVID-19 Pandemic: A Qualitative Study of Primary School Mathematics Teachers in Hong Kong,” Lo et al. reported a qualitative study which explored the use of open educational resources (OERs) in primary school mathematics teaching during the pandemic in Hong Kong. Through interviews with 13 mathematics teachers, they revealed an increased reliance on OERs to enhance online teaching and foster student engagement. However, the study also identified challenges, such as the suitability of OERs for school contexts and younger students. Based on their findings, they provided recommendations for improving OER development and ensuring collaboration between developers and teachers.

In “Engaging Students in Scientific Practices in a Remote Setting,” Lager and Lavenen explored how upper secondary students engage in scientific practices (SPs) during collaborative work in a remote setting. Their findings revealed that students’ actions in collaboration were intertwined with the use of SPs and digital resources. Challenges varied across different SPs, with developing models and constructing scientific explanations posing the greatest difficulties. Possible strategies for engaging students in SPs in online settings were discussed.

In “Enhancing Online Instructional Approaches for Sustainable Business Education in the Current and Post-Pandemic Era: An Action Research Study of Student Engagement,” Ng and Lo focused on enhancing online instructional approaches for sustainable business education in the current and post-pandemic era in a higher education institution. Through

a dual-cycle action research approach, the study examined the integration of gamification and the flipped classroom approach. Their findings indicated significant improvements in student engagement and sustained learning performance, leading to practical suggestions for flexible, inclusive, cooperative, and technically supported learning approaches.

In “A Robotic System for Remote Teaching of Technical Drawing,” Hiroi and Ito presented a robotic system designed to facilitate the remote teaching of technical drawing. The system included a document camera, projector, flat screen, and video conference capabilities. Two experiments were conducted to evaluate the system’s effectiveness, demonstrating that the projected cursor enhanced the comprehensibility of instruction. Students had a positive impression of the system’s usability and functionality, enabling improved interaction and multiple viewpoints.

3. Concluding Thoughts

The articles published in this Special Issue shed light on various aspects of online teaching and learning in the context of the COVID-19 pandemic and beyond. The articles have explored the challenges, opportunities, and innovative approaches adopted by educators and institutions during this unprecedented shift to remote education. From examining the impact on specific subjects such as mathematics, technical drawing, and business education, to investigating pedagogical strategies and student engagement in online activities, these studies contribute valuable insights to the field of online education. While the pandemic posed significant challenges, it also accelerated the exploration and implementation of instructional approaches and new technologies. The findings and recommendations shared in these articles serve as a guide for educators and institutions striving to enhance the quality of online teaching and learning experiences. As we move forward, it is essential to build on these insights and continue to adapt and refine online education practices, creating a more inclusive, engaging, and effective learning environment for students in the post-pandemic world [3,4].

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