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Digital Technology for Inclusive and Equitable Quality Education

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Abstract: One of the Sustainable Development Goals (SDGs) established by the United Nations is Quality Education, specifically aiming to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all (SDG 4). This goal emphasizes the provision of education that is accessible, fair, and of high quality to individuals regardless of their background or circumstances. Innovative technologies, such as Generative AI, offer new prospects for enhancing both the access to and quality of education. However, they also introduce new challenges that could potentially have negative impacts. This panel aims to provide a platform for sharing international perspectives, with panellists from different countries, and for exchanging ideas, experiences, and practices towards achieving SDG 4. The discussion will focus on three main areas: 1) global challenges in achieving inclusive and equitable quality education; 2) good practices in promoting inclusive and equitable education with digital technology; 3) the impact of innovative technologies, such as Generative AI in promoting access to quality education. The goal of this panel is to promote research in inclusive and equitable education within APSCE by highlighting the significance of digital technology as a catalyst for change and exploring strategies to realize quality education for all.

Keywords: Equity, diversity, inclusion, education, SDG4.

1. Introduction

Inclusive and equitable education represents a fundamental pillar of societal advancement, encapsulating the core principle that every individual, regardless of background, abilities, or circumstances, are entitled to quality learning opportunities (UN, 1948, 1966, 1989). In our rapidly digitizing world, the transformative potential of technology in education has become increasingly evident, offering unprecedented opportunities to bridge divides, broaden access, and enhance learning outcomes for all learners (Haleem et al., 2022; Starcic & Bagon, 2014). But *can we realise inclusive and equitable access to quality education with innovative use of digital technologies?*

Despite the potential and increasing adoption of digital technology, as well as the global efforts to promote inclusive and equitable quality education, including the United Nations' Sustainable Goals, numerous challenges persist, hindering millions of individuals from realizing their full potential. For example, according to UNESCO data prior to the pandemic, 250 million children and youth are currently out of school, with a disproportionate number from marginalized communities including girls, children with disabilities, and those living in conflict-affected areas (UNESCO, 2020). Furthermore, even among those enrolled in school, there are significant disparities in learning outcomes and dropout rates based on socioeconomic status, geographical location, and level of Information and Communication

Technology (ICT) skills. UNESCO's 2023 Global Education Monitoring Report asserts that while technology provides an education lifeline for some, it also excludes many others (UNESCO, 2023). The report foregrounds a critical question when evaluating the transformative potential of technology: *a tool on whose terms?*

In the research community, a large body of publications address inclusive and equitable quality education and the role of digital technology (Asongu, Orim & Nting, 2019; Costa, et al., 2024; Gottschalk & Weise, 2023). However, within the Asia-Pacific Society of Computers in Education (APSCE), there is limited research focusing on this critical area. A recent initiative, SATELUC, was introduced in ICCE2023 aiming at encouraging researchers, educators and practitioners from underrepresented countries report their ideas, research, practical applications and policies related to technology-enhanced learning (TEL). This initiative has the potential to advance TEL research and development in underrepresented countries and indirectly contribute to promoting inclusive and equitable education. Engaging the research community from under-represented countries in our Asia-Pacific region is critical because their voice is pivotal in understanding stakeholder needs.

This panel aims to promote research in inclusive and equitable education within APSCE by highlighting the significance of digital technology and exploring strategies to realize quality education for all. Its objectives align well with the overarching theme of the ICCE2024 "*Educational Technologies: Empowering Minds from Diverse Contexts*".

2. Abstracts of Individual Panellists' Presentation

2.1 Quality and Inclusive Education for Underprivileged Children (Faisal BADAR)

This talk will present challenges for achieving quality and inclusive education in low-income economies. Examples will be provided to show good practices, including design-based implementation for educating out-of-school children in Pakistan, Tanzania and Kiribati. The talk will share an inspiring journey of transforming over 600 children and their families in 15 rural and urban slums, where integration of centuries-tested one-room schoolhouse concept and contemporary digital technologies improved their quality of lives through a low-cost, high-impact Digitally Operated One-Room Schoolhouses (DOORS) model. It will highlight the importance of active involvement of local stakeholders during implementation.

2.2 Harnessing the Power of AI for Inclusive and Equitable Education (Shitanshu MISHRA)

This talk will present highlights from UNESCO MGIEP's latest report on the Ethics of AI in Learner-Centric Education and discuss the needs and challenges associated with the role of AI in education. More specifically, it will propose solutions for the fair, responsible, and safe integration of AI in Education (AIED). The talk aims to provide actionable takeaways for stakeholders, including learners, teachers, educational administrators, policymakers, and creators of AIED systems.

2.3 "Bring Your Own AI": Impediments to AIED Adoption outside the First-World (Maria Mercedes RODRIGO)

Teachers in developing countries such as the Philippines have been experimenting with the use of AI to support them in both their academic and administrative tasks. However, their experimentation is purely self-started. The higher levels of educational administrative structures are not able to provide the hardware, software, connectivity, or training to help teachers maximize the use of these tools. In this presentation, we hope to provide a more nuanced discussion these four essential elements—what types of hardware would be most accessible? What types of software or software licenses might be most useful? What are the limits of connectivity and what can we do to reach areas with limited Internet access? What kind of training and support do teachers need?

2.4 Increasing Awareness and Competence of Teachers for Inclusive Education (Weiqin CHEN)

Teachers play a crucial role in achieving inclusive education. Previous studies have highlighted the needs of providing teachers with training on digital accessibility and inclusive education. Such training can equip them with both theoretical understanding and practical skills to create accessible and inclusive digital learning materials and environments, as well as to provide necessary accommodations for diverse students. This talk will showcase examples of initiatives aimed at enhancing awareness and competence among teachers for inclusive education.

2.5 Making Room for Agency and Voice in an AI-driven World (Jon MASON)

Recent advances in generative Artificial Intelligence (GenAI) require us to recalibrate the authenticity and standardisation of teaching and learning. We are also required to reframe the problems we seek to solve, such as the wicked problem of achieving universal quality education for all. Fostering human agency has always been at the core of education yet artificial agents now stimulate and disrupt our thinking. In the new dialogic spaces enabled by GenAI *how can we maintain authentic voice? How should we think about agency? From a perspective of inclusion and equity, the question is wider in scope: how can we enable and empower the voice of the primary stakeholder?*

3. Discussion and Conclusion

The Asia-Pacific region represents a wide range of economies, education systems, and levels of access to digital technology in education. Countries within this region face diverse challenges in achieving inclusive and equitable quality education supported by digital technology. This diversity provides APSCE a unique opportunity to play a leading role in this area.

This panel aims to reflect the diversity of the Asia-Pacific region while also addressing broader and more general themes. The panel presentations and discussions will explore the challenges and opportunities associated with adopting AI technology in education, covering aspects such as hardware, software, connectivity, teacher training and ethics. These discussions will also be relevant to other types of technologies. In addition, the panellists will present good practices from specific contexts and discuss the implications of these practices for other settings.

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