Editorial: Rethinking Equity in EdTech Teacher Preparation

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As schools worldwide continue to navigate the lingering effects of the COVID-19 pandemic, issues around equity, ethics and critical uses of technology have taken a more prominent role in current discourse (e.g., Constanza-Chock, 2020). While these issues are not new, the COVID-19 pandemic illuminated significant, long-standing equity gaps experienced by many students (Office of Educational Technology, 2022).

The most obvious marker of such inequities is access to devices and high-speed Internet (Mcgilchrist, 2021). Yet, a longstanding body of literature dating back to the late 1990s and early 2000s, has illustrated that access (e.g., availability of mobile devices that students can use anytime, anyplace) is but one component of the digital divide. In fact, these studies have demonstrated that beyond access, teacher pedagogy is a key barrier when it comes to equitable uses of technology among low-income underserved students, including those with disabilities (e.g., Mouza et al., 2008; Wenglinsky, 1998; Windschitl & Sahl, 2002). These issues were exacerbated during the COVID-19 pandemic, as schools pivoted to emergency remote teaching without adequate opportunities to evaluate their choices, both in terms of technology selection and pedagogy (Heath et al., this issue).

The articles in this issue confront issues of equity and argue for the need to equip teachers with the knowledge and skills needed to critically examine questions of pedagogy, ethics, and justice with *emerging technologies* – technologies that help students create, collaborate, and learn anyplace, anytime (Mouza & Lavigne, 2000). Ideally, those of us involved in the education of teachers, and by extension K-12 students, should be reflecting on the ways edtech could potentially proliferate inequities, the role of teacher knowledge in addressing equitable pedagogies, as well as the role of research and policy in advancing just and humanized technology integration practices (Heath et al., this issue; Rogers & Labadie, this issue).

The CITE-Current Practice article, "Confronting Tools of the Oppressor: Framing Just Technology Integration in Educational Technology and Teacher Education," engages in a theoretical analysis of just technology integration, specifically as it relates to teacher preparation and professional development. Examining the historical roots of educational technology, which are influenced by policies prioritizing STEM education for defense and economic development, the authors suggest four strategies for advancing a more just technology integration in schools: utilize critical theories in research, revise standards, examine the role of education and technology in democracy, and interrogate technology integration by teaching both with and about technologies.

Similarly, the CITE-Current Practice article, "Open Pedagogy Practices in Teacher Education: Digital Spaces for Preservice Teachers' Identities," examines teacher candidates' perspectives with open pedagogy assignments. The authors define open pedagogy across four dimensions: a focus on students as creators of information, creation through collaboration, connections to a real audience, and use/creation of open education resources. Using data from 29 preservice teachers across two teacher education courses, the authors highlight the important role of collaboration in supporting preservice teachers' sense of identity within open pedagogy experiences, as well as their own understanding of open pedagogy as an equity focused practice. Results from this work have implications for teacher preparation programs with emphasis on equity-oriented practices.

The CITE-English/Language Arts Education article, "Inviting Critical Literacies into an Online Literacy Clinic During the Dual Pandemics," continues to address issues of equity and justice resulting from what the authors call the dual pandemic of COVID-19: public health crisis and racism. The article examines the shift of a university literacy clinic to online delivery during the COVID-19 pandemic. Through the collection of multiple data sources over a 12-week period, the authors present an illustrative case of one teacher as she designed critical literacies online. Critical literacies, in the context of this work refer to teaching approaches that emphasize using both "print and other media to analyze, critique, and transform everyday realities." Findings indicated that the teacher was able to use the affordances of the online environment and the student's background and interest to engage in critical literacy instruction. Findings have implications for teacher preparation in critical literacy instruction.

The CITE-Science Education and CITE-General section articles take a different angle on issues of equity. They advance our conceptual understanding of teacher knowledge, particularly as it relates to contextual elements in edtech integration and applications of technology for science education specifically. The CITE-General section article, "Situating TPACK: A Systematic Literature Review of Context as a Domain of Knowledge," advances an extension of the popular framework of technological, pedagogical, and content knowledge (TPACK) that includes *context* as a situated construct of teacher knowledge. Through a systematic literature review addressing context specifically as a domain of knowledge (XK) of TPACK, the authors articulate XK across three levels (micro, meso, and macro) and three dimensions (social, resources, and content). The proposed extension of the TPACK framework represents an important conceptual contribution to TPACK research with implications for teacher learning and professional development.

The CITE-Science Education article, "Three Domains for Technology Integration in Science Teacher Education," also advocates for new approaches to teacher preparation in science instruction that emphasize high-quality, inquiry-based practices through the use of technology. Specifically, the authors advocate that education technology, including modern mobile devices equipped with various sensors, can be used to address three domains of science instruction: (a) supporting the process of learning, (b) catalyzing the acquisition of information, and (c) communicating acquired knowledge. These approaches are illustrated through the lens of the PICRAT technology integration model (Kimmons, 2016). This work can inform the delivery of science methods courses for preservice teachers that leverage technology to support science specific learning.

Finally, in the new CITE-Objects to Think With section of the journal, an inaugural article, "Linear Motor Laboratory," describes the use of a linear motor as a means to introducing electricity and magnetism concepts. Focusing on the reconstruction of the Charles Page electromagnetic engine in the Smithsonian institutions the authors present mechanisms and learning activities with the potential to help students understand STEM principles that serve as the foundation of this invention.

References

Constanza-Chock, S. (2020). *Design justice: Community-led practices to build the world we need*. MIT Press.

Kimmons, R. (2016). *Effective technology integration. K-12 technology integration*. Pressbooks.

Macgilchrist, F. (2021). What is "critical" in critical studies of edtech? Three responses. *Learning, Media and Technology, 46*(3), 243-249.

Mouza, C., Cavalier, A., & Nadolny, L. (2008). Implementation and outcomes of a laptop initiative in career and technical high school education. *Journal of Educational Computing Research, 38*(4), 411-452.

Mouza, C., & Lavigne, N.C. (2000). Introduction to emerging technologies for the classroom: A learning sciences perspective. In C. Mouza & N.C. Lavigne (Eds), *Emerging technologies for the classroom: A learning sciences perspective* (pp. 1-12). Springer.

Office of Educational Technology. (2022). *Advancing digital equity for all*. Author.

Wenglinsky, H. (1998). *Does it compute? The relationship between educational technology and student achievement in mathematics.* Educational Testing Service.

Windschitl, M., & Sahl, K. (2002). Tracing teachers' use of technology in a laptop computer school: The interplay of teacher beliefs, social dynamics, and institutional culture. *American Educational Research Journal, 39*(1), 165–205.