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Editorial: Moving Beyond Tools: Critical Perspectives on Technology and Teacher Education in the Age of Artificial Intelligence

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Over the past several years, the use of digital technologies and artificial intelligence (AI) in K-12 education has grown significantly, a trend that was notably accelerated by the global pandemic. During this period, the field of education has witnessed a surge in the adoption of technological tools, platforms, and other commercial educational technologies services that facilitated the delivery of *emergency remote teaching* (Hodges et al., 2020). In response to a call for proposals for stories from the field during the pandemic, for instance, Ferdig et al. (2020) received 200+ proposals from teacher educators on the use of digital technologies in teacher education. These proposals focused on a wide range of practices addressing online pedagogies, collaboration, alternative field experiences, professional development, and equity considerations, among others. In recent years, the field has also seen a notable surge in AI-driven applications, fueled by the broader societal interest around AI. As these tools continue to become more deeply ingrained in classroom practice, they bring with them not only renewed opportunities for innovation but also a diverse set of challenges — ethical, legal, and pedagogical — that require thoughtful consideration.

This issue of *CITE Journal* directly addresses these challenges by focusing on studies that move beyond the technical features of digital technologies toward their role as sociotechnical systems shaped by cultural, economic, and ethical considerations (see Pleasants et al., this issue). At the heart of several studies in this issue is a growing need for educators to develop what scholars refer to as "technoskepticism," an approach where "teacher educators and scholars direct their attention to the downsides, constraints, or cultural characteristics that technologies extend, amplify, or create" (Krutka et al., 2020, p.111). Educators can explicitly teach technoskepticism by encouraging reflection and critical questioning. For instance, Krutka et al. (2023) introduced the iceberg framework, which can be used to interrogate dimensions of technology at three levels: the technical (e.g., how technologies work), the psychosocial (e.g., how technology influences human thinking and interaction), and the political (e.g., who makes decisions about technologies).

These questions are particularly pressing in K–12 contexts, where commercial platforms are widely used to fill gaps in curriculum (e.g., Khan Academy and Teachers Pay Teachers), communication (e.g., Google Classroom and Zoom), or classroom management (e.g., Class Dojo; see Nichols & Garcia, 2022). Despite their widespread uses, research indicates that the quality of the curricular materials available on some platforms, such as Teachers Pay Teachers, is mediocre, where their content is not aligned with academic standards or the diversity of the K-12 student population (Aguilar et al., 2022; Polikoff & Dean, 2019). Additionally, there are growing concerns regarding the ethical implications of these platforms including issues of surveillance, data privacy, and equity (Nichols & Garcia, 2022). As these platforms continue to involve and increasingly incorporate generative AI capabilities, teacher education programs need to support preservice and practicing teachers in navigating their uses ethically, equitably, and responsibly.

The articles in this issue respond to these critical issues through empirical studies drawing on multiple data sources that examine the perspectives of both current and future educators. Collectively, these studies urge readers to consider how to frame uses of technology in education to foreground values, ethical dilemmas, and new opportunities for innovation. In doing so, they offer important insights into ways teacher educators can create spaces of critical reflection, where participants not only use but thoughtfully interrogate both existing and emerging classes of learning technologies (Mouza & Lavigne, 2012).

The CITE-English Education article, "Teachers' Orientations Toward Texts and Tools: Critical (Re)Consideration of a Remix and Restory Assignment as a Teacher Educator," engages secondary literacy teachers in remix and restory of a canonical text in the context of a graduate level course. Initially disappointed by teachers' lack of orientation toward the "critical underpinnings of remix and restory," the author utilized an in-depth case study to unpack one teacher's tensions with texts and tools. In turn, the author built on these tensions in a practitioner inquiry reflecting on how teachers and teacher educators can collaborate on identifying their orientations toward technology and their impact on how they frame texts and technology. Findings have implications for the implementation of more critical frameworks around technology in preservice teacher education, including a shift away from individual tools or apps toward a

platform orientation, which encompasses considerations of the social, technical and economic aspects of technology.

Rather than asking teachers to remix and restory literacy works, the CITE-English Education article, "Exploring the Ethics of Multimodal Composition with AI: Student and Educator Perspectives on Evaluating and Using Generative Models in the Classroom," invites participants to reimagine (or resist) writing in the age of Generative AI that can increasingly produce and combine sophisticated text, image, and audio. Through multiple data sources the authors examined ethical issues in such multimodal composition reported by preservice teachers across two different institutions, including concerns and hopes for equitable access, bias and presentation, cheating, human creativity, and ideas for evaluating AI tools. In addition, the authors propose an approach to guiding teachers in the evaluation of AI as part of both the educational environment and the platform systems used broadly.

The CITE-Mathematics Education article, "Technologies that Persist in Mathematics Education Instruction After Emergency Remote Teaching," examines the kinds of digital tools used during the COVID-19 pandemic that mathematics teacher educations continue to use. Survey data were collected from 63 teacher educators recruited from state chapters of the Association of Mathematics Teacher Educators. Drawing on ideas of conveyance technology and mathematical action technology, the authors found that participants used various technologies to create collaborative spaces for a wide range of tasks primarily due to their ease of use. Changes persisted because they positively influenced teaching as well as cognitive and social presence of students consistent with the Community of Inquiry framework (Garrison et al., 2020).

The CITE General section article, "Computational Literacy and Artificial Intelligence Education: Unveiling Perceptions and Professional Learning Experiences of Fulbright Teachers from Less-Resourced Countries," examines the role of a professional development learning program on computational literacy and AI education for K-12 teachers from underresourced countries. With a strong attention on equity orientations, the program highlighted the role of professional learning in strengthening teacher capacity to implement computing and AI across diverse global contexts

The CITE-Current Practice article, "Tensions and Opportunities: Early Career Elementary Teachers' Perspectives on Supplementing Curriculum With Teachers Pay Teachers," reports on an exploratory qualitative study that examined the perspectives of early career elementary teachers on teaching materials available on Teachers Pay Teachers (TPT). Findings indicated that new teachers commonly use materials from TPT, yet discussed multiple tensions related to trustworthiness, ubiquity, and resource demands related to TPT use. The authors encourage teacher educators to support teachers as they critically consider what online curricular materials to download and how such resources can be utilized.

In the CITE Current Practice article, "Learning to Be Technoskeptical: Engaging Preservice Teachers in Critical Examinations of Educational Technologies," the authors report on a study where preservice teachers critically examined common learning technologies, including the popular

platforms Class Dojo and TPT. Through a series of learning activities, the authors directed preservice teachers to examine the technical, psychosocial, and political dimensions of technology. Utilizing analysis of written responses, findings revealed that preservice teachers presented more critical analyses of Class Dojo than TPT, indicating that certain classes of technology may be easier for preservice teachers to critique than others.

We wish *CITE Journal* readers a productive summer. As always, we encourage commentaries and responses.

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