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# Editorial: The Role of Teachers in Teaching and Learning With Technology

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School districts nationwide have been increasingly investing in new and emerging technologies to support teaching and learning. Emerging technologies refer to technologies that have the potential to significantly influence the processes and outcomes of teaching and learning, such as tools that help students visualize concepts, construct dynamic representations, collaborate with others, reflect on their learning, and create their own products (Mouza & Lavigne, 2012).

Historically the primary assumption driving these investments is that use of technology in the classroom will transform teaching and, by extension, student learning. Yet, existing research indicates that effective use of technology depends not only in their affordances for learning but, importantly, the ways in which they are used in practice (U.S. Department of Education, Office of Educational Technology, 2014). In particular, a number of studies indicate that teacher learning and professional development are key ingredients to the effective integration of technology in teaching and learning (e.g., Kopcha, 2012; Mouza, 2009).

Clearly, *CITE Journal* as a whole squarely addresses the role and preparation of teachers in relation to technology. The papers in this issue, however, serve as an important reminder of the role of teachers in realizing the potential of technology and the need for teacher preparation at all levels – from preservice to in-service to clinical supervisors.

In his *CITE-Social Studies Education* article, titled "A Critical Metaphor Analysis of Educational Technology Research in the Social Studies," in particular, Lance Mason cautions us that the metaphors we use to understand the role of digital technologies in our discourse may elevate the role of technology as living and autonomous while reducing the complexity of teaching and learning as a mechanistic endeavor. Mason's critical metaphor analysis of literature at the intersection of technology and social studies suggests that some specific metaphors used to describe technology as an agent of progress "may impede a more thoughtful approach to conceptualizing and implementing new technologies." Further, his analysis makes explicit "the reality that technology cannot give directions in classrooms; it can only be done by teachers and other educational professionals."

Two articles in this issue explicitly discuss ways in which we can help prepare teachers, both preservice and in-service, to direct implementation of technology through effective lesson planning and design. The *CITE-Mathematics Education* article by Aaron Brakoniecki, Julie Amador and David Glassmeyer titled, "Preservice Teachers' Creation of Dynamic Geometry Sketches to Understand Trigonometric Relationships," examines the role of dynamic geometry software in helping preservice teachers develop sketches that highlight mathematical relationships not possible with static diagrams.

Dynamic geometry software has the potential to engage students in meaningful mathematics by exploring geometric relationships, conjecture, and hypotheses. As the authors note, however, "While this tool has great potential to enhance mathematics classrooms, it is reliant on teachers' ability to build sketches that can efficiently and effectively highlight mathematical relationships." Working with two cohorts of preservice secondary mathematics teachers, the authors identify common challenges in the construction of dynamic sketches and discuss strategies that enable mathematics teacher educators to help beginning teachers understand common pitfalls in the building of dynamic geometry sketches.

The *CITE-Science Education* article by Stephen Adams, Paul Burns, and Lisa Martin-Hansen, titled "Youth Views of Science and Engineering in a Program for Preparing Teachers to Use Educational Technology in STEM Education," shifts the focus from preservice to in-service teachers. Specifically, the authors describe their effort to help teachers create engineering workshops that integrate technology, which they later deliver to youth in Boys & Girls clubs. Subsequently, the authors report results from a mixed-methods evaluation that examined perceptions of youth participants regarding science and engineering. Essentially this works helps move beyond teacher outcomes (e.g., design of workshops) to address youth outcomes as a result of teachers' practice. Overall, results of the study suggest benefits for participating youth, which according to the authors, serve as "an indicator supporting this teacher preparation model." Identifying professional development models for engineering and technology is important because, as the authors note, elementary school teachers are typically not comfortable in teaching those subjects.

Instead of pedagogical approaches that help teachers learn how to teach with technology, two other articles in this issue examine the role of technology itself in supporting teacher and supervisor learning. The *CITE-Current Practice* article by Pamela Beach, Rhonda Martinussen, Daniel Poloszczuk and Dale Willows, titled "A Window Into the Classroom: Examining the Use of Virtual Classrooms in Teacher Education," investigated the perceived usefulness of virtual classroom visits in literacy to support teacher education. Participants included both preservice teachers and teacher educators who utilized virtual tours through a professional development website. Results from this work indicated that virtual classrooms have the potential to bridge theory and practice and offer models of experienced teachers. These findings help highlight the potential of technology, in this case virtual classroom visits, to support teacher preparation by taking into account the realities of the classroom context.

The *CITE-General* article shifts attention from teacher learning to the learning of clinical supervisors responsible for mentoring future teachers. The article titled "Supervisor Learning Through Collaborative Video Inquiry: It's Not Just for Teacher Candidates" by Laura Baecher, Sherryl Browne Graves, and Fatma Ghailan examines the role of video in supporting reflection on supervisory practice among clinical supervisors. Specifically, the authors examine supervisors' self-awareness of their facilitation skills as a result of viewing their interactions with teacher candidates on video and sharing their analysis in a peer group of fellow supervisors. Additionally, the authors point to some key principles for implementing video-based professional development for supervisors in teacher education.

In closing, the articles in this issue bring to life the mission of *CITE Journal*, to publish research at the intersection of technology and teacher education. They offer examples of pedagogical practices and technologies that help facilitate educator learning amidst rapid technological advances. Importantly, they shift attention from specific technology tools to teachers, highlighting their role as *principal decision-makers* within the context of their own classrooms (Mason, this issue). As always, we encourage readers to submit formal commentaries in response to the ideas presented in these manuscripts.

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