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# Editorial: Thinking Critically About and With Technology

[Chrystalla Mouza](#)
*University of Delaware*

*CITE Journal* Volume 20, Issue 3, is published as we continue to battle the Covid-19 pandemic and school systems are preparing for mostly virtual openings. During this time of crisis, we have witnessed increased attention in using technology to support remote learning for millions of students. Due to the world-wide impacts of Covid-19 in education, we have also gained substantial insight into uses of technology with the potential to transform traditional schooling and leverage the power of new tools to create and innovate under difficult circumstances (for examples, see Ferdig et al., 2020; Hartshorne et al., 2020). At the same time, the crisis has exposed a number of challenges, including inequities in access to computers and the internet as well as inequities in the quality of online resources used for teaching and learning. At no other time in history has the work of the *CITE Journal* community been more important, as school systems and educators around the world continue to seek guidance on pedagogically sound uses of technology in K-16 settings.

This issue of *CITE Journal* addresses important themes in our efforts to strategically and productively leverage technology to reach millions of students. As Joshua Ellis and colleagues remind us in the CITE-Science Education article, ["Toward a Productive Definition of Technology in Science and STEM Education,"](#) definitions of technology "vary significantly, and they have profound implications for curricular and instructional goals." Two of the most widely shared perspectives, according to Ellis and colleagues, is educational or instructional technology and computational thinking.

The articles in this issue address these important themes, providing historical perspectives and the manner in which they have influenced contemporary uses of technology and teacher education. In particular, the Seminal Article section focuses squarely on the origins of computational thinking, a topic that has gained momentum in recent years due to a range of federal policy initiatives. Specifically, this section reproduces a seminal chapter from a book by Goldenberg and Feurzeig, "Gossip and Other Life Sentences – A Simple Grammar," which investigates the structure, function, and history of language using functions made possible by computers. As section editor Glen Bull points out in his introduction to the series, this work is important "because it provides insight into the origins of related modern-day work that it inspired."

Such modern day work, inspired from these seminal articles on coding and computational thinking, is presented in CITE-Mathematics Education. The article "Coding for the Core: Computational Thinking and Middle Grades Mathematics" by Leslie Suters and Henry Suters presents a summer institute for teachers in grades 6-8 focusing on programming along with mathematics content and pedagogy sessions. Results from this work indicated that participants' TPACK knowledge showed statistically significant increases. Further, participating teachers valued the integration of computational thinking strategies through programming and robotics.

This work is important because it recognizes the need to provide teachers with new knowledge and skills in their efforts to engage students as creators of computing innovations. Teacher preparation was one of the primary reasons that early attempts to integrate computational thinking in education did not go far. As Thompson et al. (2020) pointed out, "Teacher education, both in-service and preservice, was slow to respond and initially focused more on how to use computers than on understanding and teaching CT" (p. 5). The advancement of programming languages, however, such as Scratch and Bootstrap, has now made coding and computational thinking integration more accessible to teachers and students and, thus, holds enormous potential for teachers and students as creators and not just users of computing.

The CITE-English Language Arts Education article, "Planning for Literacy Instruction: An Evaluation of Online Resources Used by Preservice Teachers" by Pamela Beach, and the CITE-Social Studies Education article, "Pinning for Profit? Examining Elementary Preservice Teachers' Critical Analysis of Online Social Studies Resources about Black History" by Noreen Rodriguez, Michael Brown and Amanda Vickery, focus on helping preservice teachers build critical media literacy skills in evaluating and selecting online instructional resources. These articles could not be more timely, as teachers around the world continue to look for high-quality curricular resources for remote learning.

Both of these articles identified limitations in preservice teachers' abilities to select high-quality educational resources while being mindful to issues of equity and justice. These findings are consistent with a number of studies examining the information literacy skills of college students, indicating that they have difficulty evaluating online content, tend to apply evaluation checklists blindly instead of critically, and tend to trust top

results (see Athreya & Mouza, 2016; Metzger et al. 2015). Given these findings. it is important to advance critical digital literacy skills and training programs for preservice teachers.

Moving from preservice to practicing teachers, the CITE-General section article, "Instagramming their Hearts Out: What do Edu-Influencers Share on Instagram?" by Catharyn Shelton, Stephanie Schroeder, and Rachelle Curcio, explores the content that education influencers share on Instagram. The authors coded publicly available Instagram posts and stories shared by 18 influencers comprising the K-12 collaborative, Teach Your Heart Out™. Findings indicated that the content shared reflected four themes: promoting products and themselves, motivating teachers, soliciting engagement, and advocating for classroom approaches. Findings also indicated that some posts lacked thoughtful explanations and connections to critical social issues, "highlighting the need for critical digital literacies among teachers who use social media for professional purposes."

Full participation in today's digital landscape, requires teachers and students to consume messages critically while learning how to create and share them (Athreya & Mouza, 2016). This collection of articles provides insights into the manner in which preservice and in-service teachers identify and evaluate the content they consume, in addition to learning about tools that help them create with technology, such as coding and computational thinking. We hope readers find this set of articles meaningful as they embark on the most challenging academic year ever and respond to the demands of remote teaching and learning. We welcome readers' comments.

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