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Editorial: Leveraging Pandemic Lessons to Improve Teacher Education Pedagogy and Practice

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The beginning of a new academic year is always an exciting time of new opportunities. While the last 3 years have been full of uncertainty due to the continuous challenges associated with Covid-19, we are gradually learning to cope with those challenges while leveraging our experiences to design new teaching and learning opportunities.

Teacher education programs, for instance, have pioneered a number of online instructional practices with the potential to inform sustained changes in educator preparation methods and pedagogy (Baumgartner et al., 2023; Ferdig et al., 2020). Throughout the process, appreciation and use of digital tools within teacher education contexts has dramatically increased, including opportunities to integrate principles of computer science into teacher education courses to help preservice teachers acquire skills needed for work and civic engagement in an increasingly computational society.

Further, the meteoric rise of artificial intelligence, such as ChatGPT, has provided several opportunities to support educators' work, including support with developing educational resources such as course syllabi and assignments, assessments, and study guides, to name a few (Trust et al., 2023). Development of high-quality educational materials is a time-consuming endeavor for teachers, which is why access to both tools and freely available educational resources can be useful.

The articles in this issue help us address some of these topics by providing insights into online pedagogical practices that have the potential to support sustained changes in teacher education pedagogy and promote access to high-quality educational materials and tools. The CITE-Science Education and CITE-Current Practice articles examine pedagogical practices that could better prepare preservice teachers for the demands of teaching.

In CITE-Current Practice, "Preparing Preservice Teachers for Residency Through Alternative Fieldwork Experiences" examines one approach to clinical practice in teaching English to speakers of other languages, which utilizes video observations coupled with online discussions. Devised during the height of the pandemic when in-person school observations were prohibited, the authors investigated representations of practice noticed by preservice teachers while observing purposely selected video lessons, the connections of these observations to theory, and the manner in which they understand these practices in their online discussions. Findings from this work indicate that preservice teachers developed a better understanding of best practices while connecting theoretical constructions to both their observation experience and online discussions.

While the use of video has enormous potential to support purposeful observations of high-quality instructional practices, the authors were disheartened to note that these are no longer allowed as a substitute for in-person experiences at their institution. This study presents a great example of how practices implemented during the Covid-19 pandemic can inform sustainable changes in teacher education pedagogy. Despite constraints in how they can be utilized, such practices could be used to augment, support, or enhance more traditional in person experiences.

In CITE-Science Education, "Teaching Science via Computational Thinking? Enabling Future Science Teachers' Access to Computational Thinking" examines the integration of computational thinking in a science methods course for preservice teachers who work with rural elementary schools. While initiatives aimed at supporting preservice teachers' computational thinking are on the rise, few efforts examine outcomes from this work, especially as they relate to specific disciplines such as science (e.g., McGinnis et al., 2020). Further, fewer efforts focus on preservice teachers who will be working with rural students, which represents an important equity consideration in teacher education.

Using a quasi-experimental approach, the authors examined preservice teachers' motivation, skill, and use access to computational thinking (CT) before and after participation in a workshop focusing on coding and the use of simulations in science teaching. Findings from this work indicate that despite increased usage and preparedness in CT, participation in the workshop did not positively influence preservice teachers' motivation access. Findings also indicate the importance of incorporating meaningful reflection regarding educational innovations and opportunities to connect with course assignments and lesson planning.

The remaining two articles in this issue focus on the use of open educational resources and tools. In CITE-Science Education "Open and Useful? Exploring the Science Education Resources on OER Commons"

examines the types of science curricular materials available through OER Commons. Using a public Internet datamining approach, the author evaluates life science, physical science, and applied science resources to gain a better understanding of the grade level, endorsement by approved organizations, alignment with standards, and other features. Findings indicate that most resources aimed at filling specific instructional needs rather than entire curriculum and lack alignment to science standards. The author provides implications for policy and practice, specifically about building an ecosystem of curricular materials available to teachers.

Similarly, in CITE-Objects to Think With, "Metadata Standards for Educational Objects," presents an ambitious effort to establish an educational CAD Model ecosystem to facilitate effective use of educational makerspaces in areas such as science, mathematics, and engineering. Bringing together presidents of various teacher educator associations under the auspices of the National Technology Leadership Summit coalition, this effort seeks to establish norms and processes for managing a library of educational objects and associated elements, building a technical infrastructure for a CAD library of curated peer reviewed educational models aligned with K-12 instructional objectives, bringing together a community of external developers who can contribute objects to the library, and making these objects accessible to a community of users who have the support to use the objects.

The articles in this issue help us envision new ways of teacher preparation that utilize technology to overcome inherent barriers to collaboration and theory-practice connections while sharing knowledge across communities of developers and users. One of the key lessons learned during the height of the Covid-19 pandemic is the need to make knowledge, resources, and tools widely accessible to various communities of educators. As we move into the future, it is important that both researchers and educators, alike, strive to share their expertise and resources, especially high-quality and peer-reviewed resources, with the communities they intend to serve. These are important equity considerations as we seek to address outcomes associated with lost instructional time during the pandemic and support learning among all K-12 students, including those in underresourced and rural areas. As always, we encourage commentaries from readers.

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