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The Crisis We Cultivated: Educational Technology Research and Teacher Education

NATALIE B. MILMAN
George Washington University, USA
nmilman@gwu.edu

JASON TRUMBLE
University of Central Arkansas, USA
jtrumble@uca.edu

ANDREA R. HARKINS-BROWN
Johns Hopkins University, USA
aharkinsbrown@jhu.edu

PUNYA MISHRA
Arizona State University, USA
punya@asu.edu

This is the second of four editorials, each led by a different colleague, that will run quarterly in JTATE as part of an initiative that builds on Moore et al.'s (2025) invitation to address grand challenges in instructional design and technology. Recognizing the need for a coordinated vision and strategy, the 2025 National Technology Leadership Summit (NTLS) devoted one of its strands to examining "Grand Challenges in Technology and Teacher Education." An editorial report published in the "Contemporary Issues in Technology and Teacher Education" (CITE) journal described the objectives and outcomes of the strand, culminating in the call "To make technology in teacher education matter" (Milman et al., 2025, as cited in Mouza, 2025, para. 20). The four editorials are a next step in expanding the vision and strategy and will culminate in an upcoming special issue of JTATE. Additional information about the special issue will be available in 2027.

> In this second editorial, we assert that while decades of educational technology research, even with its flaws and shortcomings, provide a foundation from which to build, researchers, students, journalists, and policymakers too often ignore the lessons learned, as if each new technology emerges through spontaneous or divine creation. The failure to ground current research in scholarship beyond the past few years perpetuates the crisis of legitimacy described in our first editorial (Mishra et al., 2026), resulting in a Sisyphean cycle of educational technology that we describe further here. While this can be viewed as a grand challenge itself, we see what we do about the crisis we cultivated by ignoring the past as the more urgent need. As with the first editorial, our goal is to foster constructive discussion and critique.

> *And I saw Sisyphus at his endless task raising his prodigious stone with both his hands. With hands and feet he tried to roll it up to the top of the hill, but always, just before he could roll it over on to the other side, its weight would be too much for him, and the pitiless stone would come thundering down again on to the plain. Then he would begin trying to push it uphill again, and the sweat ran off him and the steam rose after him.*
> — (Homer, ca. 800 B.C.E./1999, Book XI)

In *The Odyssey*, Homer retells the myth of Sisyphus, a king punished for eternity by having to push a giant boulder up a mountain, only for it to roll down, forcing him to repeat this laborious, meaningless task. In many ways, educational technology research is like this myth. We ignore past research and lessons learned while repeatedly starting (and restarting) at the base of the mountain as if investigating each technology were an unprecedented phenomenon. Teacher education and technology face the same uphill climb. We can keep pushing the boulder uphill, or we can ask why it keeps rolling back down.

In describing 'the Sisyphean Cycle of Technology Panics,' Orben (2020) explains why the cycle occurs, how it hinders scientific progress, and what researchers can do to break it. Technology panics are cyclical challenges that often arise with the emergence of new technologies and are exacerbated when we ignore past research or dismiss it as outdated. We are experiencing one such technology panic now with generative artificial intelligence (GenAI) and corresponding doomsday predictions about its threats to human existence (Broad & Metz, 2026). To mitigate this, Orben recom-

mended that "scientists could try to break the Sisyphean cycle by letting future research build on past research to create a more linear and less circular progression of knowledge" (p. 1153). However, educational technology researchers perpetuate the Sisyphean cycle when they limit their literature reviews and citations to research published within the last few years. Similarly, educators may reinforce the misconception that past research has little bearing on today's technologies when they require their students to cite only current research in their assignments, sometimes even penalizing them for citing research published more than five years ago. Much like Sisyphus pushing the boulder alone, many researchers work in isolation rather than collaborating with interdisciplinary teams and key stakeholders (e.g., students, teachers, other practitioners, experts from other fields, and community members) who could provide important perspectives and expertise.

Sprague (2004) made a similar point in an editorial published 22 years ago, entitled "Technology and Teacher Education: Are We Talking to Ourselves?" In it, she called for greater dialogue and collaboration between the educational technology field and teacher educators. Given technology's prevalence in nearly every aspect of our lives (e.g., educational, social, medical, professional, and recreational), how might we further her call? The questions worth asking are practical ones: how to collaborate across disciplines with practitioners and experts from other fields; how to shape the field rather than perpetually catch up and adapt to it; how to make research proactive instead of reactive to each new technology; how to form cross-cultural teams that span cities, states, and nations; and how to design research that makes a difference in the lives of the people from whom we collect data. Where do we begin? One approach is to examine the field's roots and history while ensuring our research designs are sound. After all, to better understand the present and the future, we must comprehend, critique, and build on the past. However, we must not get stuck in the past. With technology developing so quickly and our society evolving and adapting alongside it, today's approaches to teaching with and about technology may be obsolete before most students graduate. How can we break the Sisyphean cycle that produced the crisis foregrounded in our first editorial?

UNDERSTANDING THE ROOTS OF EDUCATIONAL TECHNOLOGY RESEARCH: IGNORED AND FORGOTTEN LESSONS – DO WE HAVE AN AMNESIA PROBLEM?

Instructional design and technology (IDT), also referred to as information and communication technology (ICT) in many contexts outside of

the United States, serves as an umbrella term for educational technology. Looking back helps us better understand how and why the field developed, where it is now, and where it might go next. Many resources describe its history (e.g., Molenda et al., 2024), so we will not rehash it here. Instead, we draw attention to some of the field's defining characteristics. Although the field is built on decades of educational technology research, it is not without its own amnesia, shortcomings, biases, and flaws (Schmidt et al., 2025). Several critical patterns emerge:

1. Technology has power, privilege, and prejudice embedded within it, which often creates and reproduces inequity (Benjamin, 2019; Costanza-Chock, 2020; Noble, 2018).
2. Scholars have noted that educational technology research often lacks theory (Hew et al., 2019; Schad et al., 2021), and our scholarship is frequently characterized by techno-solutionist (Morozov, 2013), techno-determinist (Wyatt, 2008), or techno-centrist (Schmidt et al., 2025) perspectives.
3. Educational technology research may focus too narrowly on technology as a tool rather than on how it can meaningfully address practical problems in teaching, learning, or performance (Reeves & Lin, 2020).
4. 'Big Tech' (Krutka et al., 2021; Regan & Khwaja, 2019) and its associated platforms (Nichols & Garcia, 2022) have played a significant and ongoing role in the technologies we see in classrooms at all educational levels. Thus, the influence of the educational technology marketplace is shaping teaching and learning in ways we never imagined (or perhaps desired).
5. Many of the technologies purchased and used in classrooms were originally designed for other purposes, such as increasing efficiency, minimizing costs, or saving time—not for teaching or learning (Cuban, 1986, 2001; Selwyn, 2016).
6. For many years, much of the empirical research conducted in our field was quantitative (Reeves & Oh, 2017); however, more recent analyses show an increase in qualitative and mixed methods approaches (Heinrich, 2024).
7. Finally, educational technology research syntheses are predominantly produced and cited by researchers from western, educated, industrialized, rich, and democratic countries (Bedenlier et al., 2025; Buntins et al., 2025).

A closer look at past research reveals several enduring insights that may help interrupt this cycle and propel us forward.

Looking Back to Move Forward: Core Insights from Past Educational Technology Scholarship

For more than 80 years, we have learned a great deal about educational technology through studying its use in a variety of settings, as its prevalence and use have expanded from the classroom to the boardroom. However, the role of technology in classrooms and society has evolved, largely because its capabilities and purposes have changed. Prior educational technology researchers have discovered how new technologies diffuse, what supports different stakeholders need (not just teachers and students), and which conditions are necessary for meaningful use. They have also identified factors that create barriers to technology implementation (e.g., limited time). Technology's role in the teaching-learning process also depends on the context. Investigating real classrooms in natural settings is complex, and there are many potential confounding variables that can cloud findings. Given the substantial investment in technology, it is logical that parents and guardians, school principals, and other leaders and policymakers would want answers about its return on investment (ROI) and impact on student learning and achievement. This raises an important question: what do we already know? What does prior educational technology scholarship tell us? What should students of educational technology, at all educational levels, read and research to better understand the present and help design teaching and learning for the future? Understanding lessons from past educational technology research requires recognizing broader technological shifts that have shaped the field, even as the pendulum sometimes swings backwards. These changes can be categorized in several ways:

- Learning *assisted* by computers: (1960s - 1970s)
- Learning *about* computers: computer literacy (1970s)
- Learning *from* computers: skill and drill (1980s)
- Learning *with* computers: computers as mind tools (1990s - 2000s)
- Learning *influenced* by computers: computers predict, analyze, and teach; increasingly through AI (2000s - 2022)
- Learning *transformed* (or destroyed) by computers: GenAI integrated into most computing (2022 - present)

We have witnessed parallel shifts in how technology is used. Pedagogy shifted from behaviorist and passive toward constructivist and active; teachers moved from the sages on the stage to facilitators of learning; and learning itself shifted from an individual to a collaborative act. Classrooms expanded beyond the contained, brick-and-mortar computer lab to anytime, anywhere online access through one-to-one devices. Instruction moved from standardized delivery toward personalized learning, and assessment from traditional summative testing toward authentic, performance-based measures. These shifts do not necessarily equate to progress. The field often reverts to where it began: behaviorist uses remain pervasive, and assessment remains standardized, though now digitized. This is the Sisyphean pattern in another form. Teaching and learning do not exist in a vacuum. Many factors influence what happens inside of classrooms, and often those factors originate outside them.

Educational technology research has its own themes and cycles, often reacting to new technologies rather than anticipating them. In a study of educational technology research published between 1993 and 2019, Bozkurt (2020) identified steady growth in publications each year, followed by a much sharper rise beginning in 2008. While the study offers no explanation for the sharp rise beyond growing interest in educational technology, it makes sense that as technology became more prevalent, so did interest in studying it. Not surprisingly, the study's themes tracked developments in new technologies, including multimedia and online education, while the scholarship remained largely positivist and focused narrowly on technology's effectiveness.

Microcomputers in Schools

While researchers have investigated educational uses of technology for many decades, classroom-based technology research became more prevalent with the introduction of microcomputers in the 1980s. The Apple Classrooms of Tomorrow (ACOT) project, funded by Apple Computers, investigated technology in classrooms from 1985 to 1995 (Fisher et al., 1996). It is hard to imagine this today, considering how ubiquitous technology is in schools. Just two years into the project, "20 teachers and several hundred students had spent more time teaching and learning with technology than probably anyone on the face of the planet" (Dwyer, 1994, p. 5). This project represented an early example of Big Tech investment and integration in schools, and some might also argue, inculcation, as well as pio-

neering research in authentic classroom settings. Key findings included that teachers progress through five stages of adoption, the presence of technology does not ensure its adoption or use; teacher beliefs play a significant role in technology adoption and use; and successful technology adoption requires numerous supporting conditions (Sandholtz et al., 1997). These findings continue to appear in research today.

Although the U.S. Office of Technology Assessment (OTA) was established in 1972 (Technology Assessment Act of 1972), well before computers became more widespread in classrooms, the OTA published several influential reports examining technology in education:

1. *Power on! New tools for teaching and learning* (OTA, 1988)
2. *Teachers and technology: Making the connection* (OTA, 1995a)
3. *Education and technology: Future visions* (OTA, 1995b)

We highlight these reports because their authors documented teachers' uses of technology, its growing prevalence of technology in classrooms, and its major benefits and barriers. Here, we see the Sisyphean cycle again because most of these findings remain relevant today, even as technologies have changed. Similar to the ACOT studies, the authors emphasized that introducing a new technology into a classroom did not automatically result in its use or improved outcomes. Rather, multiple contextual factors influenced how and why teachers did, or did not, integrate technology. Notably, the authors stressed teacher preparation, professional development, teacher beliefs, and lack of time as critical factors in technology integration. Although the U.S. Congress defunded the OTA in 1995, its work remains highly relevant today. Nearly 40 years later, the OTA's 1988 report offers prescient insight: "Educational technology R&D requires interdisciplinary research, pulling together expertise in cognitive science, artificial intelligence, computer science, anthropology and sociology, psychology, instructional design, and education" (OTA, 1988, p. 152). It would not be surprising to see a similar quote in a report published today.

Research in educational technology has grown substantially, and various research centers have played important roles, including the University of California, Los Angeles National Center for Research on Evaluation, Standards, and Student Testing (UCLA CRESST) and the Center for Research on Information Technology and Organizations (CRITO), among many others. There are hundreds of researchers we could cite who have studied educational technology, teacher preparation, and technology in schools. This research foundation should be mandatory reading, rather than limiting our review to the immediate past.

Since its establishment in 1993, the *Journal of Technology and Teacher Education* (JTATE) has published a substantial body of research on the intersection of technology and teacher education (Davis, 2002). We invite readers to review past editorials (more than 65) that analyze entire issues and highlight what was learned from research in the journal during a particular year (e.g., Baumgartner & Ferdig, 2018; Harkins-Brown, 2025). Also, we point you to a full issue from 2004 (Volume 12, Number 2) focused on Preparing Tomorrow's Teachers to Use Technology (PT3), a U.S. federally funded initiative designed to help teacher preparation programs better prepare preservice and in-service teachers to integrate technology into their teaching. Looking back at the titles of the editorials and special issues reveals trends in JTATE scholarship.

Media Comparison Studies

Media comparison studies are important to highlight because they raise serious methodological concerns and should be avoided. Basically, these are studies that compare the use of a technology with not using that technology (Clark, 1983, 1994; Russell, 1999). For instance, a study might compare a course in which a teacher educator uses GenAI with another course in which GenAI is not used. Media comparison studies are methodologically problematic because the focus is on the technology and not the design or implementation of instruction. The lesson is not that media are neutral delivery vehicles, but, as our first editorial argued (Mishra et al., 2026), that the comparison measures the wrong thing, since each medium restructures the very conditions of attention, memory, and learning being measured. The No Significant Difference phenomenon, where it is argued that the medium does not matter, is as much a function of the crude instruments we use to measure learning as it is a property of the media themselves. When learning is reduced to what a standardized test can capture, it is little wonder that different media produce indistinguishable results; the measure is too blunt to register what each medium is actually doing.

Teacher Self-Efficacy and Perceptions

If you were to ask an editor, 'What is a topic that has been overresearched in technology and teacher education?' they would likely respond, technology and self-efficacy (especially teacher self-efficacy). So many

researchers have studied self-efficacy (Bandura, 1997) related to technology use that we can assert with confidence: the stronger one's self-efficacy, the greater one's technology use (e.g., Albion, 2001; Williams et al., 2023). Similarly, those who participate in educational technology professional development or training often experience some type of positive change. We recommend pursuing other areas of research beyond the intersection of self-efficacy and educational technology, especially in teacher education.

Evaluation of Training

The second research topic an editor might flag as being over-researched is the evaluation of educational technology training or introduction of a new technology. Although such investigations are likely very beneficial for those who designed and offered the training or introduced the new technology, their findings may have limited relevance for others and tend to repeat prior research. There are many studies that follow a predictable formula or template: 'beliefs/perceptions of <educators/students> about <add technology> or <technology training> resulting in positive findings' (Milman, 2023). It often seems predetermined that a new training or technology will affect some type of change and that objectives will be met. Frequently, researchers may be inclined to share only positive results, furthering long held techno-solutionist, techno-deterministic perspectives on technology.

Again, educational technology research tends to be Sisyphean in that its findings are often not new and repeat what researchers found decades before. It rarely has macro-level impact, although it may have a micro-level one.

A RECKONING – WE CULTIVATE AND REAP WHAT WE SOW

We must also reckon with the tensions and dichotomies in the field of educational technology and recognize our own complicity as "victims and perpetrators" (Schmidt et al., 2025, p. 514), acknowledging that we have cultivated, contributed to, and benefitted from the systems we critique. It may seem easy for us to highlight flaws and the lack of meaningful impact or translation of findings into practice in the field of educational technology. But the field is not alone! Researchers in myriad fields have faced defunding, censorship, political interference, and the misrepresentation of scientific findings. The replication crisis in psychology demonstrated how some influential findings were difficult to reproduce, highlighting problems

such as small sample sizes, publication bias, and methodological limitations (Open Science Collaboration, 2015). These are all problems that persist in educational technology to this day. Recognizing these limitations does not undermine research or science but does underscore the importance of transparency, replication, peer review, and self-correction.

We must also acknowledge that teaching and learning in real classrooms, no matter the level or topic, are complex endeavors, reflecting classroom realities that have remained largely unchanged since Jackson (1968) and Cuban (1986, 2001) described them decades ago. This complexity is often lost in journal articles and research reports because of understandable page limits, but it does not mean that important study details should be excluded or oversimplified. Describing which technologies are studied, as well as in what context, how and with whom, is critical in any research article, report, or summary, but these details are often missing. Such details are essential because they help readers understand the study and gauge its quality and replicability.

Building on Moore et al.'s (2025) grand challenges charge and our previous editorial (Mishra et al., 2026), we see a need for educational technology researchers to conduct multinational research that employs a variety of research methods, engages diverse populations, and occurs in different contexts, while aligning research questions with genuine pedagogical needs and problems. The instinct here might also be to call for longitudinal work, but we would resist it as the only choice. The technologies move too fast; a study built to run for years will describe a world that no longer exists by the time it concludes. What the moment demands is not slower research but faster, more agile inquiry, with designs that can move at something closer to the pace of the tools themselves without sacrificing depth or rigor. We also have the capability to collect and analyze large-scale data sets. Recognizing that research in the field has been largely quantitative (Reeves & Oh, 2017), and given the contextual, localized nature of the teaching-learning process, some balance of quantitative, qualitative, and mixed methods research is overdue. As is a fuller embrace of the critical and historical scholarship that situates any technology within the relations of power and the long arc of change it belongs to. Crucially, this work demands active collaboration with classroom teachers and interdisciplinary teams of scholars from all over the world to capture the full landscape of teaching and learning. Students, too, must be part of this work when developmentally appropriate, not merely as subjects of study but as co-investigators of their own learning. Striving for depth is not optional; it is the only way to disrupt the field's Sisyphean tendency toward repetitive, surface-level studies and foster transformative scholarship for the future.

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