A Long Arc Bending Toward Equity: Tracing Almost 20 Years of ELA Teaching With Technology

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Almost 20 years ago, Pope and Golub (2000) published their seminal work on teaching with technology in English language arts (ELA) classrooms in *Contemporary Issues in Technology and Teacher Education Journal* (*CITE Journal*). The purpose of this systematic literature review was to learn how subsequent research about ELA teaching with technology has taken up (or not) Pope and Golub's ideas in *CITE Journal* since their initial publication. In addition, the authors were concerned with how articles about teaching and technology use have incorporated thinking about issues of access and equity to digital and online literacies in relationship to Pope and Golub's principles. Findings of the review are presented and implications are offered for supporting teachers and educational researchers as they enact and study ELA teaching with technology to promote socially just classrooms.

English language arts (ELA) is a required subject in the United States schools, and its essential content — the use and production of language — is one of the oldest cultural tools (Everett, 2012). Conceptualizing language as a tool is critical when considering the ways in which inequity is produced and reproduced with language (McBee-Orzulak, Lillge, Engel, & Haviland, 2014).

As language is used in these ways, ELA teachers are increasingly encouraged to consider notions of social justice in their teaching. The term *social justice* changes as communities and our understandings about what comprises them shift alongside political, social, and technological developments. Social justicetaps into Marxist (Anyon, 2011) arguments that wealth, privileges, and opportunities should be distributed fairly, but such a distribution is atypical in educational settings. In educational research, the term social justicealso evokes a framework for understanding *literacies* as a broad, socially situated concept. Banks (2004) wrote,

Literate citizens in a diverse democratic society should be reflective, moral, and active citizens in an interconnected global world. They should have the knowledge, skills, and commitment needed to change the world to make it more just and democratic. (p. 291)

Before Banks, Freire (1997) considered how analysis and critique without hope left students without agency to change their situations. If students can use and produce texts that represent their experiences, they can change their lives for the better. Likewise, if the English language arts — and all that they encompass in print and digital form — mirror students' lived experiences, then educators can build more entry points for students who may have been previously marginalized (Moran, 2018).

In this context, practitioners face a complex and shifting landscape with regard to social justice. Responsibilities on that landscape include the following:

- Selecting young adult novels to teach that represent diverse experiences (Glaus, 2014);
- Attending to potentially shocking content in student writing (Anderson, Labbo, & Martinez-Roldan, 2003);
- Taking on roles as *de facto* English language and literacy support for English learners and speakers of Global Englishes (Galloway, 2017);
- Teaching students on the verge of classification/reclassification for disability (Kennedy & Ihle, 2012);

- Attending to commonplaces of grammar and social justice, such as shifting gender pronoun use (Purdue Online Writing Lab, 2018);
- Learning to guide students in using, reusing, and remixing material in various modalities (Palmeri, 2012); and
- Supporting all students in becoming better writers, thinkers, and arguers in multiple disciplines and subjects (Newell, VanDerHeide, & Wynhoff-Olsen, 2014).

As teachers and teacher educators have grappled with how to meet these responsibilities, digital technologies have taken on a greater presence in schools. By some measures, the quality and availability of digital technology in school, along with the digital literacies of teachers and students, have increased significantly (Gray, Thomas, & Lewis, 2010). Moreover, teachers generally are committed to using digital technologies in the classroom, although researchers are often critical of whether teachers use technologies to their full advantage (Bauer & Kenton, 2005; Ertmer & Ottenbreit Leftwich, 2010; Overbaugh & Lu, 2008; Rice, 2016; Woolfe, 2010).

In addition, research on digital technology use in education as a whole has not considered generalized access and extent of use (Davies & West, 2014). An ongoing conversation in ELA has centered around how to use digital technologies to promote subject matter knowledge. Beginning with Selfe (1989), multiple scholars (Bush, 2002; Pope & Golub, 2000; Young & Bush, 2004) have made committed attempts to encourage technology use in ELA teaching. This article was undertaken in the interest of drawing attention to this strong tradition, as well as a concern for the integration of an equitable ELA curriculum.

Purpose of This Review

For almost 20 years, *Contemporary Issues in Technology and Teacher Education (CITE Journal)* has been a place for ELA teachers and teacher educators to share research about effective digital practices. The purpose of this article was to report our investigation of the ways in which *CITE Journal* articles have added to the conversation about digital technology in ELA since its inception.

We recognized the lack of explicit discussion in published articles in regard to access and equity through digital pedagogies. Nevertheless, we wanted to explore and illustrate the ways in which notions of social justice were treated because we are committed to future technology integration in ELA classrooms where social justice-orientated teaching is the norm, not the exception. In addition, we wanted to consider Pope and Golub's (2000) article outlining guidelines for the preparation of ELA teachers since it was the first article published in the first issue of *CITE Journal* in the English/Language Arts Education section.

Specifically, we looked for ways digital pedagogies had engaged the field over the past 20 years. We viewed this engagement as imperative for promoting digital literacy within the scope of ELA, as well for informing teachers, higher education instructors, and educational researchers about the directions of research and trends in the integration of technology, ELA, and social justice paradigms. The research questions for this review were as follows:

1. How has research published in *CITE Journal* since 2000 engaged with Pope and Golub's (2000) recommendations?
2. In what ways does this engagement promote equity and social justice teaching in ELA?

In investigating these questions, we identified several critical gaps in the research, particularly with regard to equity and access.

Framing This Review Conceptually

One of the earliest works and most-often cited pieces in the preparation of ELA teachers for digital technology came from Selfe (1989). In her edited volume *Computers in English and the Language Arts: The Challenge of Teacher Education,* she described ELA teachers as dealing with a "dizzying, complex world of educational technology *and* instructional change" (p. 14, our emphasis). Selfe also described the ways ELA teachers had to compete with mathematics and science teachers for computer access and decried the use of digital technology for low cognitive work like essay typing. This argument hinted at social justice in that access for all content areas and the necessity of challenging assignments were important issues to consider in high-quality ELA teacher preparation programs.

Another important development in the field was Barton's (1993) articulation of two primary areas of technological focus: computers in writing instruction and integrating digital technology into concepts and definitions of literacy. In incorporating literacy, Barton tapped into the educational clime dubbed "New Times" (Luke, 1998, p. 305). These New Times were not only about digital technologies — they were about acknowledging social justice issues in literacy instruction.

Eventually, 21st-century skills gained more importance in ELA teacher preparation and teaching. As a response to this emerging interest, Pope and Golub (2000) developed curriculum standards or guidelines for the preparation of English teachers with regard to digital technology. These guidelines were published in *CITE Journal* as a seminal article in its inaugural volume:

1. introduce and infuse technology in context;
2. focus on the importance of technology as a literacy tool;
3. model English language arts learning and teaching while infusing technology;
4. evaluate critically when and how to use technology in English language arts classroom;
5. provide a wide range of opportunities to use technology;
6. examine and determine ways of analyzing, evaluating, and grading English language arts technology projects; and
7. emphasize issues of equity and diversity. (p. 90)

Several years later, Bush (2002) challenged Pope and Golub (2000) in the same journal, saying that while their guidelines were clear, they offered no advice as to how to accomplish these goals in teacher education. Further, they offered no clear rationale for *why* these specific things should be done.

As an alternative, Bush (2002) proposed that activities in teacher education that focused on technology should support teacher education programs in evaluating whether they were (a) helping teachers learn to understand appropriate and inappropriate uses of technologies in ELA classrooms, (b) creating an understanding of context in the integration of technologies, and/or (c) ultimately supporting teachers in becoming reflective and critical in their uses of technologies.

At the heart of Bush's (2002) critique is the notion that teachers of ELA (or any subject) should not teach with digital technologies just to do so. Instead, the purpose should be firmly grounded not merely in social goals (or even social justice goals), but as strategic

pedagogy. He argued schools receiving expensive and flashy gifts of technology should be suspicious of their donor's intent.

Educators should not use digital technology, in his view, until doing so could genuinely enhance teaching and learning. Bush's (2002) Marxist orientation to technology use and his warning that it not be used without questioning who benefits and why have social justice underpinnings. His worry was that schools would become flooded with technologies to distract them from larger issues of educating all students.

Young (2004) wrote what he referred to as a critically based pedagogical framework for ELA teachers and published it in *CITE Journal*. In this article, he called Pope and Golub's (2000) work "a good starting point" (p. 2). Young argued that the purpose of the first article was to provide more specific directives for ELA teacher education programs. The crux of his new work was to profile programs in ELA that were attempting to meaningfully integrate digital technology into teacher preparation as Selfe (1989) had done previously. Before sharing these models, Young listed goals technology should achieve in an ELA classroom and things that it should not:

Technology *Should ...*

- Validate individual students and empower their ability to achieve academic and "real world" success;
- Supplement and enhance instruction and, in effect, work almost transparently and seamlessly with content instruction;
- Supplement and enhance traditional print/literature/media materials;
- Provide additional resources and create wider access to them;
- Expand students' means of expression and broaden their opportunities to reach meaningful and authentic audiences;
- Deepen students' understanding of complex issues and enhance their ability to make more global connections;
- Expand and enhance the definitions and dimensions of literacy (critical, digital, media and otherwise); and
- Facilitate an open forum for discussion that allows for more opportunities for free and democratic participation and dialogue.

Technology *Should Not ...*

- Replace complex language and developmental goals with more simplistic "learn technology" goals;
- Replace teachers or pedagogy;
- Complicate or supersede content instruction or become the content focus of instruction itself;
- Replace or overshadow traditional print/ literature/media materials.
- Limit appropriate resources or access to them;
- Disrupt or complicate normal classroom community efforts and objectives for addressing audience;
- Diminish students' ability to participate or contribute by favoring students with advantaged access to technology;
- Deepen social, racial, gender, and economic inequalities;
- Stifle creativity or opportunities for using the imagination or multiple Intelligences; or

- • Completely replace teacher-student and/or student-student "face-to-face" communication and interaction. (p. 12)

These lists are important for several reasons. First, they began a conversation in teacher preparation as to whether digital technology had a rightful place in a curriculum of its own accord or whether it should only be used as a means of achieving other curricular ends. These attempts at preparation standards also raised social justice concerns about equity and access as freedom of mind.

Young's (2004) pronouncement that an overemphasis on digital technologies could "deepen social, racial, gender, and economic inequalities" (p. 12) underscored the growing concern among researchers, teachers, and teacher educators that relationships with students could be damaged by the robotic anonymity of computers. Students, he claimed, should be able to do interesting work that addresses their cognitive, linguistic, social, and even affective needs for interaction with teachers and peers.

A final critical element in establishing a field ethos or general agreement about technology use, literacies, and social justice purposes appeared in 2006. Swenson, Young, McGrail, Rozema, and Whitin moved away from teacher education and focused instead on English educators:

Newer technologies are reshaping our lives and our communities in complex ways. Thus, an examination of literacy practices involving technologies deserves special attention, not because they are separate, but because they are central to effective English education in a rapidly changing world. (p. 351)

Solidifying technology integration as a literacy issue was critical for the conceptualization of social justice as a new ELA field concern. Historically, ELA pedagogy had been about reading linguistic texts and responding to them with more spoken and written text. Now, students needed skills for developing facility with new texts and the new ways they could be produced.

The extension of this argument is reflected in the National Council of Teachers of English (NCTE) *Beliefs for Integrating Technology into the English Language Arts Classroom* (Lynch et. al., 2018), where the first belief identified literacy as being "more than reading, writing, speaking, listening, and viewing as traditionally defined. It is more useful to think of *literacies*, which are social practices that transcend individual modes of communication" (para. 10). This statement tied technology to social practice, formalizing the connection to equitable discourse and what Friere (1970) posited as a "human activity," which consists of "action and reflection," which in turn, "is transformation of the world" (p. 106).

With regard to pedagogies and social justice in ELA, scholars like Garcia, Mirra, Morrell, Martinez, and Scorza (2015) wrote about the intersections of critical literacy pedagogies and the notion that literacy in action can function in a way that ties to social power and ultimately provides a blueprint for personal and social transformation. Along with critical media pedagogy (Morrell, Duenas, Garcia, & Lopez, 2013), different literacies and pedagogies that function under the premise of social justice include culturally relevant pedagogies (Ladson-Billings, 1995), culturally responsive pedagogies (Gay, 2002;), culturally sustaining pedagogies, (Paris, 2012) and multicultural literacy (Banks, 2004).

Finally, the literacies that enable or constrain social justice are contingent on access. Librarians like Bishop, Bazzell, Mehra, and Smith (2001) wrote that "the digital divide is really a socioeconomic, cultural, and power divide that exists at both the local and global

level" (para. 26). In short, ELA content teaching has become enmeshed with concepts of literacies, social justice, access, and criticality in demanding ways. To meet these demands, they have utilized new literacies, new pedagogies, and digital tools. The question is, how has ELA research in *CITE Journal* reported the use of these new practices to meet the enmeshed demands?

Methods and Strategies

Mobilizing colleagues across the nation to investigate and review all articles published in the English/Language Arts Education section of *CITE Journal*, we conducted a detailed thematic analysis of all articles from Volumes 1-18, which corresponded to the years 2000-2018. In conceptualizing our task, we borrowed from Onwuegbuzie and Frels (2016), who viewed the stance of critical dialectical pluralism as a philosophical lens which "represents a social justice paradigm, the goal of which is to give voice and to empower the people who are being studied" (p. 54).

With a critical lens, we approached this literature review as an opportunity to represent the challenges teachers face in attending to Pope and Golub's (2000) seven principles across K-16 levels. Dialectical pluralism in and of itself allows for integration of multiple lenses and viewpoints, which is critical for a large research team. By adding *critical* to the lens of dialectical pluralism, we lived into the notions of representing equity and diversity in digital pedagogies and literacies because our focus extended from which articles represent one or more of the seven principles(Research Question 1) to what challenges remain in attending to the seven principles, particularly in voicing concerns for marginalized communities (Research Question 2).

A lens such as critical dialectical pluralism allows for multiple lenses to dialogue with each other in productive ways. It is also essential to recognize that inquiries such as this one need to balance the flexibility of exploration and discovery with the strict boundaries of rigor. The strategies in the following section illustrate the procedures of this process, which represent the ways in which we attempted reliability measures in the subjective process of coding articles for representation of the seven principles.

Search Strategies

Our team of 12 scholars represented a diversity of viewpoints and geographic regions — ranging from the Western United States to the Deep South — and consisted of researchers at all stages of their careers. In addition to the authors on this manuscript, our thinking was informed through several discussions at Digital Literacies in Teacher Education (D-LITE) commission meetings at the NCTE and Conference on English Education (CEE, now called ELATE) in 2017.

We accessed the *CITE Journal* English/Language Arts Education tab on the journal's website (https://www.citejournal.org) listing all the articles up to those published from its inception. After an initial read through the early issues of the journal, we centered our work on Pope and Golub's (2000) original article. Through emailed discussions, we agreed that this first article contained a roadmap for infusing digital technologies into the ELA curriculum and classroom. It has been cited frequently since publication, and its guidelines remain touchstones for ELA teachers and researchers.

We used themes for codes in our analysis of the subsequent 18 volumes (72 issues). The themes were the seven principles outlined by Pope and Golub (2000). We split the issues and volumes across researchers grouped in pairs (dyads), and initially created a table

inclusive of all articles that explicitly references at least one of the principles. This table illustrated how each article — listed by volume, issue number, and author — demonstrated one or more of Pope and Golub's (2000) seven principles.

Excluded from the analysis were reviews, commentaries, and calls that did little more than introduce the theme of a particular volume/issue or allude broadly to a concept in the seven principles (10 total). Additionally, some issues and volumes did not publish ELA-related articles.

Because teams worked together to read and analyze the full articles for theme, this action was the initial cross-check for accuracy. Once all included articles were referenced in a table illustrating various principles (see Google document at https://docs.google.com/ [document/d/1d-67UAWZJa7akh0UdMDGDH5qOOrxGfWnMVxQpI_LV-](https://docs.google.com/) [I/edit?usp=sharing](https://docs.google.com/)), one of the researchers ran an additional cross-check of the articles, comparing the abstracts to the principles they were listed under.

When the table was complete, all of the applicable publications in *CITE Journal* were listed under a certain principle. Some articles were listed under several principles as they attended to multiple themes — these have been reported in the results section. We then redistributed principles to reconfigured colleague teams, who were then tasked with rereading the articles listed under the principle, summarizing each article, and writing brief introduction and implications sections for the principle as a whole.

The teams were reconfigured for several reasons. First, we needed to re-align teams to account for members who had left the project. Second, we wanted to check reliability and iron out inconsistencies of what was represented under each principle. These teams would first read the articles independently, then come together to review the themes. Teams met several times synchronously via video conferencing platforms.

Three prompts guided the subsequent writing of each separate principle implications section: (a) state the standard and define what it means; (b) discuss the articles that fit into that standard and why they fit; and (c) discuss the trends and general evolution of the standard from the beginning of the journal to the present. The key themes that emerged across principles included accounting for the multiple threads of technology implementation, enacting a critical digital pedagogy, and reimagining the work of teacher educators.

Findings

Findings were structured to first summarize the ways in which specific articles attended to each principle, outlined in table format. Each table features an analysis of how, cumulatively, the articles attended to that particular principle. Additionally, each analysis illustrated how notions of social justice emerged in the articles listed for that particular principle.

Our analysis revealed that ELA teachers, teacher educators, and researchers have been attending to Pope and Golub's (2000) call to bring digital technologies and literacies into the ELA classroom and curriculum. From victory narratives to failed attempts, authors described their efforts to engage students and enliven the literary canon for nearly 20 years. Many went beyond the standard curriculum, while others found that pushback and lack of access kept them from achieving their goals. We present findings for each principle and a chart that describes how specific articles represented that principle. Following the chart is a short section identifying the implications for the principles.

Principle 1: Introduce and Infuse Technology in Context

In this first principle, Pope and Golub (2000) addressed the introduction and infusion of digital technology within the ELA curriculum and/or in the classroom. They declared this principle was the sine qua non, or the most essential element, of ELA technology use. Principle 1 stated specifically that digital technology should not be a "naturally supporting background for both content" (p. 90) and pedagogy.

In 2015, George, Pope, and Reid revisited the principles with an eye toward the future of digital technologies. In the resulting follow-up article, they noted that Principle 1 remained relevant and that it was still a challenge to look past the "terrific bling" of new digital tools and "make decisions based on how such offerings further student learning" (para. 19).

Articles addressing this core concept ranged from descriptions of specific strategies and tools to practical suggestions for integrating the technology into the existing course of study. Table 1 details the specific articles and their discussion of digital technology that was infused in context.

Table 1
Technology in Context Across 17 Years of *CITE Journal*

Author(s), Year, and Title	Research Context	Technology Introduction and Infusion
Carroll, P. S., & Bowman, C. A. (2000). Leaping fire: Texts and technology.	Proposed theoretical framework for teaching with technology in an ELA curriculum.	Authors argued that along with art, creative exploration, and critical literacy, technology is a way for teachers to embrace student abilities and thus improve instruction.
Carico, K. M., & Logan, D. (2001). The pull of participation: Multilogues in online literature discussions.	Preservice teachers and middle school students recorded responses to multicultural literature in a chatroom.	Preservice teachers and middle schoolers converged in a virtual space online, called a Multi-user Object Oriented environment, or MOO, to discuss multicultural literature.
Pace, B. G. (2001). Amazon, eBooks, and teaching texts: Getting to the "knowing how" of reading literature.	Author as researcher-participant described the use of electronic readers with preservice teachers.	Students used electronic-readers to slow their reading of poems and participate in literature circles. The technology supported active reading and encouraged student engagement with the text.
Pieters, B. (2002). Infusing technology in the English classroom: One teacher's journey.	Highlighted a series of online tutorials to guide community college students in literary analysis.	The author "infused technology" into a composition course by creating hyperlinks within text that acted as "tutorials" for students and helped them analyze specific literary works. The result was that the author spent more time talking with students one-on-one.
Mincey, K. C. (2002). A recipe for reluctant researchers: Blending	Provided specific links to websites and tools that are useful	The author used websites to scaffold her instruction of the research-paper writing process. Using the internet for

Author(s), Year, and Title	Research Context	Technology Introduction and Infusion
personal narrative with reading, writing, and arithmetic from electronic sources.	for college instructors who want to scaffold the research process.	legitimate research purposes was a relatively new idea at the time of the article's publication.
Bush, J. (2002). Commentary: Beyond technical competence: Technologies in English Language Arts teacher education (A response to Pope and Golub).	Offered a framework for teaching with technology in response to Pope and Golub (2000).	The author designed a framework for his use of technology in the ELA classroom. The key question was not "how?" but "why?" There was an emphasis on substance over style.
Bucci, T. T., Copenhaver, J., Johnson, L., Lehman, B., & O'Brien, T. (2003). Technology integration: Connections to educational theories.	Featured action research on preservice elementary teacher candidates for integrating technology in their own classrooms.	Described specific strategies and methods that were used to provide preservice elementary education teachers with a conceptual framework for integrating technology into their future classrooms. Digital tools and workshops were integrated in the curriculum. Examples included a technology template created by the International Society for Technology in Education (ISTE), work in a technology teaching lab, and digital videos.
Schmidt, D. A., Merkley, D. J., & Fuhler, C. J. (2003). Integrating technology into an intermediate literacy methods course.	Chronicled integration of technology into a literacy methods course for elementary education students.	Activities leveraged course materials using technology and provided preservice teachers the opportunity to engage with meaningful technology tasks (included course CDs with websites, course materials, and activities as well as literature databases that students added to and annotated). Literature circles were videotaped and shared asynchronously among the groups; then all participants discussed these videos synchronously online live.
Myers, J. (2004). Using technology tools to support learning in the English Language Arts.	Author positioned himself as researcher-participant to describe his "hypermedia projects" on educational topics for preservice teachers.	Electronic portfolios, analysis of texts through message boards, and website creation were described in this article as a means for integrating technology into a methods course for preservice ELA teachers. The projects, called "hypermedia projects," encouraged the "analysis and critique of possible identities, relationships, and values signified by the tests and their multiple possible readings" (para. 1).
Myers, J., & Beach, R. (2004). Constructing critical literacy practices	Authors were researcher-participants who	Preservice teachers designed collaborative, inquiry-based, multimedia projects, such as media

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through technology tools and inquiry.	leveraged hypermedia inquiry projects on educational topics fostering critical literacy practices.	collages, with the use of various digital tools to develop critical consciousness and community agency.
McGrail, E., & Rozema, R. (2005). Envisioning Effective Technology Integration: A Scenario for English Education Doctoral Programs.	Researchers identified technology-infused instructional practices to prepare doctoral level candidates.	Proposed a theoretical approach to practical integration of technology into a doctoral level course in three ways: the coursework, comprehensive exams, and original research.
Scherff, L & Paulus, T. (2006). Encouraging ownership of online spaces: Support for preservice english teachers through computer-mediated communication.	Novice English teachers working as interns in a professional development school posted and responded to each other on an asynchronous online discussion board.	Novice teachers used the discussion board to share good and bad classroom experiences and to support each other throughout the internship. They suggest that spaces where novice teachers can drive discussion, rather than the teacher educator setting specific questions or a strict structure, can be valuable.
Ray, B.B. & Coutler, G.A. (2008). Reflective practices among Language Arts teachers: The use of weblogs.	Researchers conducted a mixed methods study to determine if random entries from 21 middle and high school English teacher's Web logs (blogs) demonstrated reflective practice and to what extent.	Reflections were present in all 21 blogs ranging from casual reflection about daily events to meta-reflective posts involving changes in practice. They suggested cooperating teachers could mentor intern teachers to compose reflective blogs so they could share with each other.
Courtney, A. M., & King, F. B. (2009). Online dialog: A tool to support preservice teacher candidates' understanding of literacy teaching and practice.	Mixed methods research study with preservice undergraduate literacy methods courses.	Examined how online, asynchronously conducted discussions influenced and impacted preservice teachers' literacy understanding. The focus was on guided small group preservice teachers using discussion boards, not classroom practice.
Sanden, S. & Darragh, J. (2011). Wiki use in the 21st-Century literacy classroom: A framework for evaluation.	Combined three established frameworks to devise six core questions to assess incorporation of technologies in classrooms as a means to building new literacies. The authors then	Blended frameworks were the 2008 NCTE Position Statement, Lankshear and Knobel's 2006 work, and Cummins, Brown, and Sayers' 2007 criteria for utilizing technology. The six core questions (involving examining student agency, collaboration, critical literary opportunities, multiple streams of information, developing literacy strategies for managing various types

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	purposefully selected wikis to demonstrate their framework.	of texts, and attention to student background) were applied to several wikis. The authors concluded that constructing wikis afforded students valuable opportunities for collaboration which were more meaningful than working alone when using technology to explore new literacies.
Ruday, S. (2011). Expanding the possibilities of discussion: A strategic approach to using online discussion boards in the middle and high school English classroom.	Online discussion boards in the middle and high school English classroom.	Encouraged ELA teachers to consider how online discussion boards may provide valuable exchanges of information in middle and high school English classrooms. He explored the affordances and constraints of online discussion boards as sites to expand class discussions. He offered four recommendations involving the use of discussion boards to promote thoughtful responses, to establish an authentic audience, to provide opportunities to utilize Web 2.0 technologies, and to use as formative assessments. Ruday (2011) also issued three cautions in regards to communication tone, access, making sure time is well spent.
Pope, C., Beal, C., Long, S., & McCammon, L. (2011). They teach us how to teach them: Teacher preparation for the 21st Century.	Using the novel *The Outsiders*, the authors collected qualitative data, including detailed field notes, preservice teachers' reflections, and digital videos, across three years to analyze preservice teachers' views about the power of middle school students as teacher educators.	A three-year study of the Technological Pedagogical Content Knowledge (TPACK) framework was used to demonstrate how technology can be infused naturally into a novel study. Both preservice teachers and middle school students made meaning through "actional, visual, and linguistic resources" (p. 329) by writing and producing music videos about *The Outsiders*.
Baecher, L., Schieble, M., Rosalia, C., & Rorimer, S. (2013). Blogging for academic purposes with English language learners: An online fieldwork initiative.	Six preservice English teachers and six preservice TESOL teachers used blogging during fieldwork to prepare 24 ELL students in 11th and 12th grade who were being prepared for high	Weekly blog posited high school students with a quote or maxim and they wrote about how it related to a work of literature they had read in class. The cooperating teacher provided modeling and feedback to the 12 preservice teachers when evaluating the blogs.

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	stakes testing in large urban high school that had not met its Annual Yearly Progress (AYP) goals.	
Sherry, M. B. (2014). The Student Writing Archive Project (SWAP): Designing a searchable database of student writing and teacher commentary for English teacher preparation courses.	A pedagogical piece on technology and technological applications in the classroom. Sherry (2014) created the Student Writing Archive Project (SWAP), a searchable database of student writing with teacher feedback and teacher interviews.	SWAP was used in three courses—teaching methods, writing pedagogies, and linguistics—to fill in the gap for preservice teachers with limited field experiences lacking students from a variety of ethnic, cultural, social, and linguistic backgrounds.
Benko, S. L., Guise, M., Earl, C. E., & Gill, W. (2016). More than social media: Using Twitter with preservice teachers as a means of reflection and engagement in communities of practice.	Two teacher educators discussed the advantages and disadvantages of Twitter with preservice teachers in writing methods courses.	Researchers wanted students to tweet their reflections on course readings and their field experiences in a writing methods course. Researchers modeled the kind of engagement they expected by replying on Twitter to postings.
Zoch, M., Meyers, J., & Belchers, J. (2016). Teachers' engagement with New Literacies: Support for implementing technology in the English/Language arts classroom.	Qualitatively observed in-service teachers' technology integration after their experience in a graduate course focused on New Literacies.	Documented the introduction of the concept of New Literacies and the use of digital tools to in-service teachers during a masters-level New Literacies course that culminated in a two-week writing camp for students in grades 3-12. The researchers followed up with the participants and found that they had integrated digital tools in their classrooms, citing their experiences in the literacy class and the writing camp as models for their lessons.
Cook, M. P., & Bissonette, J. D. (2016). Developing preservice teachers' positionalities in 140 characters or less: Examining microblogging as dialogic space.	Researcher-participant modeled Twitter engagement with social justice issues connected to YAL novels but found that Twitter is not as effective for achieving social justice as hoped.	Modeled socially conscious Twitter postings and responses when participating with the students (n=20) before, during, and while reading the YAL novels. Cook and Bissonette's (2016) purpose was "to spark conversation, to ask guiding questions, to validate and encourage deep thought, and to model positionality development and articulation" amongst the preservice teachers (p. 88).

Author(s), Year, and Title	Research Context	Technology Introduction and Infusion
Rust, J. (2017). Pedagogy meets digital media: A tangle of teachers, strategies, and tactics.	Ethnographic study chronicled the partnership between a college level teacher-researcher and a Midwestern high school teacher-researcher about emerging tensions that developed during the incorporation of new digital tools and pedagogy with students in two 10thgrade English courses. The classroom had WiFi access and was equipped with several computers.	Researchers enhanced the face-to-face courses with an online community building platform called Ning, used primarily for multimodal composition. Teachers also incorporated Poll Everywhere, Twitter, Pinterest, and Critical Web Reader. After examining the tensions that emerged when content knowledge, pedagogical knowledge, and technological knowledge collided, the authors classified their findings into five categories: vantage points, genres, boundaries, tasks, and expectations.

Articles addressing Principle 1 all promoted the use of digital technologies in the ELA classroom and reported on the results of trying to integrate these technologies without turning them into superfluous add-ons. Authors cited specific tools, such as e-readers (Pace, 2001), message/discussion boards (Myers, 2003; Ruday, 2011), wikis (Sanden & Darragh, 2011), blogs (Baecher, Schieble, Rosalia, & Rorimer, 2013; Ray & Coulter, 2008), and Twitter (Benko, Guise, Earl, & Gill, 2016; Cook & Bissonette, 2016) as vehicles for enhancing the traditional content.

The authors' use of these tools were consistent with each tool's development and rise in popularity, demonstrating that many authors were aware of digital trends and explored how to bridge these with in-school literacies. The articles demonstrated that novels (Pope, Beal, Long, & McCammon, 2011) and even critical literacy skills (Myers & Beach, 2004) could be enhanced through the strategic use of digital technologies. Students still read literature, wrote about literature, and looked for ways to make literature relevant to their lives — all with the aid of new digital technologies. The technology acted as a support, not an add-on, within the context of the traditional curriculum.

The articles demonstrated that mainstream ELA content, including the literary canon, could be enhanced through strategic use of online information and digital tools. Authors also argued that science/technology and art/literature could coexist easily when using digital technologies. Teachers and teacher educators showed that digital content works best when it is integrated and infused within the broader contexts of lessons.

In terms of social justice and equity, the articles focused on this principle generally attended to content in the context of the technology, rather than the students. In other words, the focus was not on how different students might approach the digital content, but rather how the content can be changed or adjusted to meet an objective. While humanizing content is one step toward equitable pedagogy, explicitly identifying unique student needs — particularly those of marginalized status — is equally, if not more, important.

Ruday (2011) provided a strong contribution to social justice thinking on this principle when he noted that that not every student would have equal access to a class wiki inside and outside of school. In addition, Sherry (2014) built a SWAP database showcasing student writing and teacher responses with sensitivity to English language learners. In many other studies issues of social justice and equity were veiled as references to increasing student engagement and taking into account student experiences without particular consideration about why students might be disconnected from school or what experiences students might bring.

Principle 2: Focus on the Importance of Technology as a Literacy Tool

The articles listed in Table 2 focused on the importance of technology as a literacy tool. Specifically, they referenced technology tools and applications as facilitators of literacy instruction and described ways to use technology to increase competency in reading, writing, or both. George, Pope, and Reid (2015) noted that the ideas behind Principle 2 had shifted over the years. Simple notions of reading and writing had been augmented by digital literacy that included a separate set of skills for comprehending digital sites, tools, videos, and social media. In this frame, teachers must develop fluencies in both print and digital literacy skills and then position students to be as fluent.

Table 2
Technology as a Literacy Tool Across 17 Years of *CITE Journal*

Author(s), Year, & Title	Research Context	Technology as a Literacy Tool
Carroll, P. S., & Bowman, C. A. (2000). Leaping fire: Texts and technology.	Proposed theoretical framework included thinking about "computers" as a creative element in the ELA curriculum.	Technology could be used to enhance ELA instruction and promote more creativity among students than with printed texts alone. Technology, they argued is among the "essential materials" for literacy instruction.
Carico, K. M., & Logan, D. (2001). The pull of participation: Multilogues in online literature discussions.	In an after-school program, students and university students engaged in Multi-user, Object Oriented (MOO) virtual environments to read and discuss multicultural literature.	The MOO virtual environment offered "access to a larger number of ideas, perspectives, concerns, and increased opportunities for dialogic experiences for students" than could be afforded through a singular study of the literature. The collaborative experience allowed for increased literacy.
Pace, B. G. (2001). Amazon, eBooks, and teaching texts: Getting to the "Knowing how" of reading literature.	Proposed electronic readers and electronic books as a way to engage students in reading and literary analysis.	Electronic books, or e-readers, helped students to slow down and read with more intention. The inclusion of this technology enhanced the author's literacy instruction and promoted active reading.
Mincey, K. C. (2002). A recipe for reluctant researchers: Blending	Presented specific websites and a protocol for	Research was the literacy skill emphasized in this text. Through the description of a series of steps, the

Author(s), Year, & Title	Research Context	Technology as a Literacy Tool
personal narrative with reading, writing, and arithmetic from electronic sources.	enhancing the research paper writing process.	author argued that electronic and technological tools could be important elements in traditional research.
Myers, J. (2003). Using technology tools to support learning in the English language arts.	Author described "hypermedia projects" that engaged preservice teachers and offered new ways to think about digital composition.	Emphasized multimedia interpretations and how different forms of texts, such as video, images, etc., could be analyzed for value and identity.
Black, A. (2005). The Use of Asynchronous Discussion: Creating a Text of Talk.	Explored the practice of asynchronous online discussion in a college level literacy course. The author used examples from both undergraduate and graduate level coursework.	Identified the practice of online discussion as a mode for dialogue (a communicative skill within the notion of literacy). She considered how the online discussion was situated as both an assessment (a final product) and a process of reflection and communication.
Wilder, H., & Mongillo, G. (2007). Improving expository writing skills of preservice teachers in an online environment.	Experimental exploration of special procedures used in a game-like online expository writing experience that was designed to help preservice language arts teachers develop descriptive writing skills.	Used an online game to develop descriptive expository writing skills. Participants were shown a set of similar objects and asked to write a description that would allow another person to correctly identify it.
Shoffner, M. (2007). Preservice English teachers and technology: A consideration of weblogs for the English classroom.	Considered the specific technology of weblogs, this author explored the need for preservice teachers to construct a working pedagogy that included the use of technology within the content area for teaching and learning.	Described how weblogs can be used as journals and may be expanded to include, "news outlets, course discussion sites, group support systems, community bulletin boards and individual issue platforms, as well as personal journals and hyperlinked Web sites" (p. 248). Included questions to consider when incorporating blogs into the curriculum as a literacy practice.
Ray, B. B., & Coutler, G. A. (2008). Reflective practices among Language Arts teachers: The use of weblogs.	Examined 21 teacher-created language arts blogs to determine whether randomly selected entries within the blogs demonstrated reflection on professional practice. In addition, entries were examined to determine the depth of reflective practice.	Teacher-created blogs revealed a depth of reflective practice, which varied from casual to meta-reflection, although most were in the shallow reflective range.

Author(s), Year, & Title	Research Context	Technology as a Literacy Tool
Woodcock, C. (2009). Fight the dragons: Using online discussion to promote critical literacy in teacher education.	Explored the role of online discussion in the ways it fosters critical literacy by analyzing the online discourse of preservice English teachers in an online literature course.	In a hybrid course on teaching children's literature as part of a teacher preparation program, participants created and sustained an online discussion that helped promote their understanding of critical literacy.
Courtney, A. M., & King, F. B. (2009). Online dialog: A tool to support preservice teacher candidates' understanding of literacy teaching and practice.	Mixed methods research study using preservice undergraduate literacy methods courses. This research examined how online, asynchronously conducted discussions influenced and impacted preservice teachers' literacy understanding.	Demonstrated how asynchronously conducted discussions supported preservice teachers in acquiring and refining the content and pedagogical knowledge needed to teach literacy. The online discussions did not supplant classroom instruction but guided a small group of preservice teachers in furthering their understanding of how to teach literacy skills.
Shoffner, M. (2009). "Because I know how to use it": Integrating technology into preservice English teacher reflective practice.	Examined the role of technology in preservice teacher reflection.	Situated in informal reflection, preservice English teachers' choice of a specific technology medium for reflective practice was examined for satisfaction with their choice and understanding of that medium's influence on their reflection. Participants were given the choice to reflect through printed text, a blog, or via email to their professor. They had the option to include visual/auditory elements. A written Word Doc was the most commonly chosen modality because it was "easy."
Young, C. A., Long, S., & Myers, J. (2010). Editorial: Enhancing English language arts education with digital video.	Editorial call for teachers to help secondary English students "become proficient in the new literacies inspired by 21st-century technologies" (p. 9).	Meaning was "created through the interaction between visual and verbal resources," (p. 9) and "the role of audience and the social aspect of writing" (p. 9) have become central features of the new composing models of today. Everyday literacies and all modes of communication must be part of the English language arts curriculum. Not only should secondary English teachers emphasize these skills with their students, but English teacher educators too should emphasize these skills with the preservice teachers they work with.
Figg, C., & McCartney, R. (2010). Impacting	University researchers, teacher candidates,	Language development, oral history, and movie-making were explored

Author(s), Year, & Title	Research Context	Technology as a Literacy Tool
academic achievement with student learners teaching digital storytelling to others: The ATTTCSE digital video project.	language and technology instructors, student learners, and families from diverse backgrounds partnered in an invitational teaching/learning experience to create stories and construct digital movies with reference to their family history.	through a summer enrichment program. The authors found that participants were teaching the tool rather than teaching WITH the tool to promote various literacy practices. Using the student voice of non-standard English speakers (Cajun), participants attempted to develop writing/language skills through digital storytelling.
McGrail, E., & McGrail, P. (2010). Copying right and copying wrong with Web 2.0 tools in the teacher education and communications classrooms.	Approach for English education and communications college students to prepare them for understanding the complexities of publishing in digital formats.	Described the legalities of publishing online in expanded digital texts, as well as advocate for the use of digital tools for communication purposes.
Brass, J., & Mecoli, S. (2011). The (failed) case of the Winston Society wikispace: The challenges and opportunities of Web 2.0 and teacher education.	Through an examination of a wiki, questionnaires, and a focal group interview, this author described the reasons a wiki garnered limited uptake among classroom teachers.	Examined the case of the Winston Society, a short-lived wikispace created by a high school English teacher to foster collaborative knowledge-making and social activism among educators. The participants cited time commitment, unfamiliarity, and discomfort as reasons they did not use the space. This article emphasized the failed attempt to promote a digital space for reflective practice and critical literacy.
Pope, C., Beal, C., Long, S., & McCammon, L. (2011). They teach us how to teach them: Teacher preparation for the 21st century.	Used the young adult novel, *The Outsiders*, as the basis for a research study on collaboration between preservice teachers and middle school students.	After a collaborative reading of S.E. Hinton's *The Outsiders,* participants created music videos on the novel's themes. Literacy practices emphasized multimodal literacies as well as traditional reading comprehension.
Rodesiler, L. (2014). Weaving contexts of participation online: The digital tapestry of secondary English teachers.	Five secondary English teachers used digital platforms as a literacy tool for their own instruction.	Used the framework of participatory culture to investigate the ways five secondary English teachers used multiple learning platforms to create learning networks for their own professional development. Affordances of digital platforms included multimodal components, asynchronous and synchronous flexibility, and connections with a broad range of other teachers.

Author(s), Year, & Title	Research Context	Technology as a Literacy Tool
Laughter, J. (2015). ELA teacher preparation 2.0: Critical media literacy, action research, and mashups.	Pedagogical context (with preservice teachers) and procedures for examining research paradigms, exploring qualitative methods, and generating findings while developing a foundation for Critical Media Literacy.	Preservice teachers analyzed mashups to understand action research and develop critical media literacy. The author used the assignment originally to prepare future teachers to use their classroom for social justice.
Zoch, M., Myers, J., & Belcher, J. (2016). Teachers' engagement with new literacies: Support for implementing technology in the English/language arts classroom.	Qualitative study of in-service teachers who were enrolled in a graduate level course that focused on new literacies and the integration of technology with literacy. The authors followed the teachers into their classrooms once the graduate course ended to see if and how they were integrating technology.	Participants in this study felt restricted by testing and felt that technology instruction was geared toward testing, with students learning "how to click in a bubble instead of how to pencil in a bubble" (p. 40). The authors sought to provide a reminder of the prominent role testing plays in schools and how what might seem innovative—a one-to-one laptop ratio for students—can actually be another form of supporting testing.
Cook, M. P., & Bissonette, J. D. (2016). Developing preservice teachers' positionalities in 140 characters or less: Examining microblogging as dialogic space.	Instructors modeled the use of Twitter as a dialogic space with preservice teachers as they read and analyzed young adult literature (YAL) through a social justice lens.	Despite attempting to use Twitter as a dialogic space to discuss the intersections of social justice and YAL content, many preservice teachers in the YAL class used Twitter within their comfort zone and did not fully engage with this digital platform as a reflective and analytic space.

These 20 articles emphasized the frustrations and successes of using technology as a literacy tool. In the earlier articles, simply using the internet and basic software was seen as a way to deepen learning and promote engagement among students (Carroll & Bowman, 2000; Carico & Logan, 2001; Pace, 2001).

At the millennium and beyond, access to the internet and finding a sufficient number of devices were the main frustrations for those willing to make the deep dive into using technology for literacy. Authors emphasized that students enjoyed reading and writing in the digital world, but that students also needed instruction in critical digital media literacy in order to make sense of new tools (Cook & Bissonette, 2016; Laughter, 2015; Zoch, Myers & Belcher, 2016).

In these articles, social justice notions emerged from concerns about critical literacies, including the critique of current events, young adult literature, and even the United States assessment structure. Authors called on digital tools to be used not only to enhance literacy instruction but to promote elements of social justice (Cook & Bissonette, 2016; Zoch et al., 2015).

For example, Cook and Bissonette (2016) shared lessons learned in having preservice teachers attempt analytic discussions about the intersections of social justice and representations of social justice in young adult literature. Zoch, Myers, and Belcher (2015) alluded to the need for equitable practice in 1:1 initiatives to avoid simple test prep and rather accentuate equitable access and enhanced digital literacies for a broader population of students. Similar to Principle 1, articles in Principle 2 either did not attend to social justice at all or framed it through terms like social justice or equitable practice without further defining the terms.

Principle 3: Modeling ELA Teaching and Learning With Technology

Principle 3 advocated modeling ELA teaching and learning while infusing technology into teaching practices. Pope and Golub (2000) suggested that, though it is valuable for teachers to use technology to model reading and writing processes, teachers should also model learning to use new technologies themselves. In reviewing articles for Principle 3, it became clear that modeling teaching and learning ELA while infusing technology has received consistent attention across the life of the journal, though there were variations in how authors approached modeling in these 33 articles.

While some articles simply called for modeling, others documented how professors metacognitively used digital technologies in their own practices so students could do the same. Some of the authors did not use the term *modeling*, instead opting for other terms such as showing, demonstrating, and creating — often without specifying a technical meaning of these terms. Table 3 details these findings.

Table 3
Modeling ELA Teaching and Learning through Technology Across 17 Years of *CITE Journal*

Author(s), Year, & Title	Research Context	Issues of Modeling ELA Teaching and Learning Addressed
Alvine, L. (2000). A 20th Century English teacher educator enters the 21st century: A response to Pope and Golub.	Author as researcher-participant advocated modeling after examining her own use of technology as a graduate student and as a professor of various English Education courses.	Supported Pope and Golub's call for modeling "to emphasize the importance of making specific, explicit plans to incorporate technology in teacher education classes" (p. 102). Alvine modeled her own computer use when teaching the writing process. Her graduate students, enrolled in a course about research on teaching literature and literacy, agreed that students needed to be taught how to use technology, but assessments should not measure computer acumen.
Medicus, D., & Wood, S.W. (2000). The power of technology to inspire students and teachers in English language arts classrooms.	Authors modeled and advocated technology as one of multiple methodologies for preservice and practicing secondary ELA teachers to use as an interactive,	Created PowerPoint presentations to model for students and shared a variety of technology tools that teachers can use in the classroom, including free fonts, Power Point, tape recorders, video cameras, and online journals. Ideas for incorporating oral histories, student reflection, and art are

Author(s), Year, & Title	Research Context	Issues of Modeling ELA Teaching and Learning Addressed
	thought provoking, stimulating entity into the world of literacy.	shared. Authors also shared links and three appendices so journal readers could replicate this process.
Carroll, P. S., & Bowman, C. A. (2000). Leaping fire: Texts and technology.	Provided a psychological and sociological theoretical base for Mendicus and Wood (2000) who advocate modeling.	Called for support for classroom teachers so technology could be utilized/modeled as an essential material for literacy instruction. Their theoretical framework posed that technology could enhance pedagogical practices when computers are used as creative elements.
Pace, B. G. (2001). Amazon, eBooks, and teaching texts: Getting to the "knowing how" of reading literature.	Author as researcher-participant modeled and described the use of electronic readers with preservice teachers.	Explicitly modeled the electronic-reader to preservice teachers in a reading methods class and provided step-by-step instructions in an appendix to the article. Students used electronic-readers to slow down their reading of poems and participate in literature circles. The technology supported active reading and encouraged student engagement with the text.
Dail, J. (2001). Responding to the new issues in literacy instruction.	Commentary supporting Pace (2001) in her efforts modeling and incorporating electronic reading devices into her courses.	Advocated that teachers need to repeatedly model metacognitive skills, but questioned how teachers could model technology devices when teaching literacy skills if they were still struggling to learn the technology themselves.
Pieters, B. (2002). Infusing technology in the English classroom: One teacher's journey.	Modeled instruction by creating a series of online tutorials about community college students in a composition course.	Detailed how author created hyperlinks within text that acted as tutorials for students doing an activity called "hot modeling," which helped them analyze specific literary works in a composition course.
Bush, J. (2003). Commentary: Beyond technical competence: Technologies in English Language Arts teacher education (A response to Pope and Golub).	Offered a framework for teaching with technology in response to Pope and Golub (2000) and advocate practicing pedagogical uses which involves modeling.	Argued that teachers do not have the luxury of thinking about technology and ELA pedagogy as separate entities resulting from time constraints with preservice teachers. However, the author noted practicing pedagogical uses before integrating it into the classroom when time permits.
Young, C. A. (2004). Teaching the English language arts with technology: A critical	Situated a pedagogical framework for technology integration	Presented four case studies involving teacher modeling digital literacy including Jamie Myers. Young recognized the literature validated

Author(s), Year, & Title	Research Context	Issues of Modeling ELA Teaching and Learning Addressed
approach and pedagogical framework.	to inform secondary ELA practice.	technology incorporation during writing instruction. He cited a gap in the literature in regards to teachers developing technology literacy themselves which hinders enhancing instruction.
Myers, J. (2003). Using technology tools to support learning in the English Language Arts.	Author positioned himself as researcher-participant to describe his "hypermedia projects" on educational topics for preservice teachers.	Integrated hypermedia into his own writings as models for preservice teachers so they could approach literary analysis from international perspectives while supporting second language learning. Author included links and samples of his students' collaborative literature analysis projects for review; teachers could replicate this.
Myers, J., & Beach, R. (2004). Constructing critical literacy practices through technology tools and inquiry.	Authors were researcher-participants who leveraged hypermedia inquiry projects on educational topics fostering critical literacy practices.	Preservice teachers designed collaborative, inquiry-based, multimedia projects, such as media collages, with the use of various digital tools to develop critical consciousness and community agency. Authors included links and images from these works as models for classroom replication.
Swenson, J., Rozema, R., Young, C. A., McGrail, E., & Whitin, P. (2005). Beliefs about technology and the preparation of English teachers: Beginning the conversation. Contemporary Issues in Technology and Teacher Education	Five authors initiated a conversation regarding beliefs about technology and preservice teachers.	Authors supported preservice teacher instruction that included modeling. They argued that technology integration will be insignificant unless time for professional development and improved technology access is provided.
McGrail, E., & Rozema, R. (2005). Envisioning effective technology integration: A scenario for English education doctoral programs.	Identified technology-infused instructional practices to prepare doctoral level candidates in three program components. This included coursework and comprehensive exams, teaching practicum, and research and dissertation.	Argued for professors to instruct preservice teachers to model technology effectively especially in states which have adopted technology standards.

Author(s), Year, & Title	Research Context	Issues of Modeling ELA Teaching and Learning Addressed
Kajder, S. (2006). In search of the technology-using English teacher: A response to Swenson, Rozema, Young, McGrail, and Whitin.	Editorial response to "Beliefs about Technology and the Preparation of English Teachers: Beginning the Conversation" (Swenson, Rozema, Young, McGrail, & Whitin, 2005); Kajder detailed the everyday integration of technology into her own practice.	Recognized that it is impossible for ELA teachers to stay ahead of technology tools; instead, they should focus on the flexibility and teaching students to think about the capacity of the tools. Preservice teachers are best served by showing them how to evaluate potential value added benefits of technology integration.
Myers, J. (2006). Literacy practices and digital literacies: A commentary on Swenson, Rozema, Young, McGrail, and Whitin.	Theoretical response to the position paper called "Beliefs about Technology and the Preparation of English Teachers: Beginning the Conversation" by Swenson, Rozema, Young, McGrail, and Whitin (2005).	Called for preservice teacher educators to redefine digital literacy. Teaching the tools alone is destructive to school and home digital literacy practices. Advocated that professors to model the use of multimedia technologies in their own composing practices to evidence the relationship with determining identity, negotiating community identity and values. These projects could serve as models for their students.
Tendero, A. (2006). Facing versions of the self: The effects of digital storytelling on English education.	Teacher-researcher case study that explored possibilities of digital storytelling in English education settings, drawing on data from one preservice teacher as she composed a digital narrative from her observations and footage obtained in her field placement.	Discussed the creation of a screenplay reflecting on a digital storytelling assignment in her English methods class. Describing herself as "techno-shy," her inquiry focused on how digital storytelling might enrich English methods when students are asked to create a video narrative of their teaching selves. Her screenplay served as a model demonstrating how she learned to use video to reflect deeply on her teaching practice alongside her students and identifying the challenges inherent in the complex work of visually representing teaching.
Lock, J. (2007). Inquiry, immigration and integration: ICT in preservice teacher education.	Teacher educator reflected on the efficacy of a project designed to promote pre-service teachers' reflection on explicitly integrating technology into English as a Second Language curriculum.	Technology integration "suffers from an absence of modeling," and the article described a "learning environment that was created and modeled for preservice teachers" (p. 575). She concluded that the practice of building inquiry-based projects connected to current events through technology should be an integral part of teacher education rather than an afterthought.

Author(s), Year, & Title	Research Context	Issues of Modeling ELA Teaching and Learning Addressed
Solvie, P. & Kloek, M. (2007). Using technology tools to engage students with multiple learning styles in a constructivist learning environment.	Thirty preservice teachers' use of technology in a reading methods course with a constructivist approach.	Preservice teachers watched video clips of teachers modeling various reading strategies on a SMART Board. This technology tool provided concrete experience allowing preservice teachers to engage first as students and then as discussants who identified effective (and less effective) teaching practices.
Kajder, S. B. (2006). Bringing New Literacies into the Content Area Literacy Methods Course.	Described a literacy methods course with a multiliteracies approach, pushing pre-service teachers to consider an expanded notion of the boundaries of ELA.	Emphasized the importance of providing pre-service teachers with experience with multimedia tools, explaining that "the goal is to model relevant learning, deep inquiry, knowledge production, and the use of the most powerful cultural tools available for communicating those ideas" (p. 94). Author provided examples of multiple kinds of technology integration.
Sweeder, J. (2007). Digital video in the classroom: Integrating theory and practice.	Documents a videography unit in an educational technology course designed to prepare pre-service teachers to integrate technology into their future classrooms.	Described the instruction unit, provided examples of student work, and excerpts from their reflections which demonstrate the importance of providing pre-service teachers with the experience of creating their own videos as a model for their future curricular planning.
Hughes, J., & Robertson, L. (2010). Transforming practice: Using digital video to engage students.	Case studies of three ELA teachers' integration of technology from methods to teaching contexts.	Analysis traced the integration of technology in three teachers' classrooms following their experience with a digital literacy autobiography in a methods course. Examples of pre-service teacher work and the assignments they give to their high school students suggested that their methods experience served as a model for their later practice.
Figg, C. & McCartney, R. (2010). Impacting academic achievement with student learners teaching digital storytelling to others: The ATTTCSE digital video project.	Three-year longitudinal study focused on the integration of writing, technology, and diversity, documenting a digital storytelling project and its impact on teacher candidates, student learners, and	Immersive experience enrolled preservice teachers in a workshop to introduce them to digital storytelling tools and methods modeled by workshop leaders. They then created digital family histories in a summer program for at-risk middle school students. Moving from learner to creator provided them with an opportunity to experience models of instruction with digital tools that they then enacted.

Author(s), Year, & Title	Research Context	Issues of Modeling ELA Teaching and Learning Addressed
	invited community members.	
Sanden, S. & Darragh, J. (2011). Wiki use in the 21st-century literacy classroom: A framework for evaluation.	Framework for evaluating technology integration and models its application to the use of multiple wiki projects implemented in grades 6-12.	Authors modeled the application of their evaluative framework to wiki projects, using screen captures from multiple wikis as examples. They argued that their framework draws attention to the need to focus on involving students in the processes of constructing their own knowledge and that some wikis model one approach to doing so.
Ruday, S. (2011). Expanding the possibilities of discussion: A strategic approach to using online discussion boards in the middle and high school English classroom.	Collection of recommendations for teachers to use online discussion boards with middle and high school ELA classrooms. This is based on literature containing theory and practice.	Advocated for teacher guidance (through modeling) when using online discussion boards in the secondary English classroom, citing Pope and Golub's (2000) realization that the teacher's role will change from that of an 'information giver' to one of architect and facilitator.
Spires, H. A., Wiebe, E., Young, C. A., Hollebrands, K., & Lee, J. K. (2012). Toward a new learning ecology: Professional development for teachers in 1:1 learning environments.	Outlines the way 1:1 initiatives alter the learning ecology.	Developed a conceptual model of 1:1 classrooms in which the teacher and every student has a computer (networked device) that showcased the interdependence of teachers and learners who should model for each other. "No one person possesses all of the skills and knowledge (technology knowledge, content knowledge, etc.) that are needed to function within the new ecology" (p. 234).
Shanahan, L. (2012). Use of sound with digital text: Moving beyond sound as an add-on or decoration.	Researcher presented an interpretive case study of a 5th grade teacher enacting a unit on integrating audio signs into digital projects.	Described a 5th grade teacher who modeled reading and writing strategies. The teacher relied on students to model their technology strategies for her and the class when "her students were more technologically savvy than she was" (p. 270).
Baecher, L., Schieble, M., Rosalia, C., & Rorimer, S. (2013). Blogging for academic purposes with English language learners: An online fieldwork initiative.	Six preservice English teachers and six preservice TESOL teachers used blogging during fieldwork to prepare 24 ELL students in 11th and 12th grade	Cooperating teacher provided modeling and feedback to 12 preservice teachers when evaluating the blogs and then the preservice teachers modeled for each other. The 24 ELL students in grades 11 and 12 attended a large urban high school, which had not met its Annual Yearly

Author(s), Year, & Title	Research Context	Issues of Modeling ELA Teaching and Learning Addressed
	who were being prepared for high stakes testing. The setting was a large urban high school which had not met its Annual Yearly Progress (AYP) goals.	Progress (AYP) goals. The weekly blog published a quote or maxim and secondary students wrote about how it related to a work of literature they had read in class.
Shoffner, M. (2013). Editorial: Approaching technology in English education from a different perspective.	Teacher educator discussed how preservice teachers are prepared to use technology as part of pedagogy.	Argued that the purpose of technology integrating in ELA classes should be to enhance digital literacy. The author argued for the importance of experience and guided practice. She advocated that teachers invite technology into their own thinking and be role models for technology integration in all aspects of ELA teaching by implementing it into their instructional methods as well as in coursework for students.
Wake, D., & Whittingham, J. (2013). Teacher candidates' perceptions of technology supported literacy practices.	Surveyed 57 secondary and elementary level preservice teachers regarding perceptions of various technologies and their impact and influence on K-12 education.	Preservice teachers in a methods course were provided with a rationale that in future they would have to demonstrate resourcefulness by teaching themselves about technology so they could teach it to their own students. The preservice teachers taught themselves blogs, wikis, digital storytelling, Voicethread, Glogster, and Prezi. The study concluded that preservice teachers needed to feel comfortable with the apps themselves before modeling them with students. Sometimes, they chose which apps to use based on their level of familiarity rather than pedagogical fit.
Sherry, M. B. (2014). The Student Writing Archive Project (SWAP): Designing a searchable database of student writing and teacher commentary for English teacher preparation courses.	A pedagogical piece on technology and technological applications in the classroom. Sherry (2014) created the Student Writing Archive Project (SWAP), a searchable database of student writing with teacher feedback and teacher interviews.	SWAP filled in the gap for preservice teachers with limited field experiences lacking students from a variety of ethnic, cultural, social, and linguistic backgrounds. Modeling writing and responses with sensitivity to writers who are English language learners were showcased. SWAP was used in three courses - teaching methods, writing pedagogies, and linguistics.
George, M., Pope, C., & Reid, L. (2015).	Reflected on the relationship between	Identified principle three as stable, noting that "The classroom as a shared

Author(s), Year, & Title	Research Context	Issues of Modeling ELA Teaching and Learning Addressed
Contemporary literacies and technologies in English Language Arts teacher education: Shift happens!	CITE and CEE since the journal's beginning. They put the seven principles advanced by Pope & Golub in 2000 into conversation with the more recent TPACK model.	environment remains, with professors modeling for teacher candidates and teacher candidates modeling for professors" (n.p.).
Benko, S. L., Guise, M., Earl, C. E., & Gill, W. (2016). More than social media: Using Twitter with preservice teachers as a means of reflection and engagement in communities of practice.	Two professors discovered the advantages and disadvantages of Twitter with preservice teachers in writing methods courses.	Researchers asked students to tweet their reflections on course readings and their field experiences in a writing methods course. Researchers modeled the kind of engagement they expected by replying on Twitter to postings.
Cook, M. P., & Bissonette, J. D. (2016). Developing preservice teachers' positionalities in 140 characters or less: Examining microblogging as dialogic space.	Modeled Twitter engagement with social justice issues connected to YAL novels but found that Twitter is not as effective for achieving social justice as hoped.	Modeled socially conscious Twitter postings and responses when participating with students while reading YAL novels. Cook and Bissonette's (2016) purpose was "to spark conversation, to ask guiding questions, to validate and encourage deep thought, and to model positionality development and articulation" amongst the preservice teachers (p. 88). Even though the results suggested that the students bypassed the professor's efforts of guidance and modeling to stay within their own comfort zones, the researchers remained positive "that Twitter, YAL, and social justice can work synergistically" (p. 105).
Zoch, M., Meyers, J., & Belchers, J. (2016). Teachers' engagement with New Literacies: Support for implementing technology in the English/Language arts classroom.	Observed in-service teachers' technology integration after their experience in a graduate course focused on New Literacies.	Documented the introduction of the concept of New Literacies and the use of digital tools to in-service teachers during a masters-level New Literacies course that culminated in a two-week writing camp for students in grades 3-12. Researchers followed up with the participants and found that they had integrated digital tools in their classrooms, citing their experiences in the literacy class and the writing camp as models for their lessons.

The articles in Table 3 advance modeling as an important strategy (McGrail & Rozema, 2005; Ruday, 2011). Simultaneously, they cautioned that teachers should ensure that ELA content does not lose ground to instruction on how to use the technologies that support it (Myers, 2006; Shoffner, 2013; Young, 2004).

Several scholars demonstrated the possibility of modeling with a variety of technologies, including video and digital storytelling (Figg & McCartney, 2010; Tendero, 2006), blogs and microblogging platforms (Benko et al., 2016; Cook & Bissonette, 2016), and programs to support English-as-a-second-language teaching and learning (Baecher et al., 2013; Myers, 2003; Sherry, 2014). The constant changes characteristic of new technologies, however, provoked a question that animated much of the work included here: How do teachers model technology integration into ELA teaching and learning practices when they are unfamiliar with either the conceptual or practical affordances that a particular technology might offer (Bush, 2002; Dail, 2001; Sanden & Darragh, 2011; Shanahan, 2012; Wake & Wittingham, 2013; Young, 2004)?

Scholars addressed this question in a variety of ways. Some pointed to the importance of building professional development experiences that provided prospective and practicing teachers with an opportunity to practice modeling. These experiences allowed teachers to be students first, encountering the technology in a methods class or workshop setting that guided them in both how to use it and how to teach it to their own students (Figg & McCartney, 2010; Hughes & Robertson, 2010; Zoch et al., 2016).

Others shared experiences with modeling technology-infused ELA teaching as examples. They described the modeling that they did for their students and, in doing so, provided the reader with a model to work from as well (Kajder, 2006; Myers, 2003; Tendero, 2006). Finally, some called for reimagining student and teacher roles so that students could model technology integration when they had relevant experience (Shanahan, 2012; Spires, Wiebe, Young, Hollebrands, & Lee, 2012).

Although these articles rarely referenced social justice explicitly — Cooke and Bissonette's (2016) experiment with using Twitter to promote social justice engagement with young adult texts is a notable exception — there was some attention to problems of equitable access. For example, Ruday (2011) emphasized that the classroom can play a critical role in providing computer access to students who do not have access to technologies at home. He advised teachers to take into account what kind of access to technology students had at home before planning lessons that required independent access to it (p. 358).

For this principle, it is clear how Sherry's (2014) creation of the SWAP database was important for social justice. With reference to Principle 3, Sherry (2014) provided preservice teachers with models to engage with student writing from "diverse linguistic/geographic regions of the United States" (p. 194), a move that promotes more inclusive classrooms by introducing preservice teachers to models of the linguistic varieties of student writing possible.

Also, several authors envisioned the technology-infused ELA classroom as an ecology where teachers and students were positioned as coconstructors of knowledge, each taking responsibility for modeling what they knew about content or tech use to achieve instructional goals (Figg & McCartney, 2010; Sanden & Darragh, 2011; Spires et al., 2012). This validation of student expertise and reconfiguring of power dynamics is an important step toward a more socially just classroom.

Principle 4: Evaluate Critically When and How to Use Technology

In Principle 4, Pope and Golub (2000) argued that teachers and their students must be critical users of technology. Such a critical analysis approach involves "a process for questioning and probing both the why and how of infusing technology through various applications, programs, websites, methods of teaching, or communication tools" (Pope & Golub, 2000, p. 93). In 2015, when George, Pope, and Reid revisited the initial Principle 4, they emphasized an even greater need to make the decision-making processes about technologies transparent to teachers and students. Thirteen articles made explicit connections to Principle 4. Table 4 summarizes these connections in these articles.

Table 4
Evaluating Critically When and How to Use Technology Across 17 Years of *CITE Journal*

Author(s), Year, & Title	Research Context	Critical Evaluation of Technology Integration
Pace, B.G. (2001). Amazon, e-books, and teaching texts: Getting to the "knowing how" of reading literature.	Teacher educator illustrated how to use e-readers with preservice teachers in a reading methods class.	Teacher educator made the process of reading e-text in the literature classroom transparent to teachers. The teacher educator also evaluated the technical affordances of e-readers (e.g. adjustable text size, bookmarks) for helping preservice teachers examine their reading and literary analysis processes.
Bush, J. (2002). Commentary: Beyond technical competence: Technologies in English language arts teacher education (A response to Pope and Golub).	Editorial written by a middle school teacher and teacher educator in response to Pope and Golub's (2000) article.	Like Pope and Golub (2000), this teacher educator articulated the importance of a critical evaluative stance toward technology in ELA instruction. Such a stance required a shift of focus in the questions being asked from "how" – "technical competence," to "why" – critical evaluation competence. The author then modeled how he applied this stance to evaluate the use of technology in his teacher education classroom.
Young, C. A. (2004). Teaching the English language arts with technology: A critical approach and pedagogical framework.	Young (2004) situated a pedagogical framework for technology integration to inform secondary ELA practice.	Established a pedagogical framework to assist ELA teachers to develop a critical mindset towards teaching with technology. To integrate technologies and create a relevant context for its use, the researchers propose educators use the following strategies: develop a pedagogical framework, ask important questions, and establish working guidelines. Young (2004) concluded that the framework is a beneficial component that can enhance their professional development despite the challenges for integrating technology.
Merkley, D., Schmidt, D., Dirksen, C., &	Chronicled how one reading teacher used	Discussed how a reading tutor used virtual platforms to share student

Author(s), Year, & Title	Research Context	Critical Evaluation of Technology Integration
Fuhler, C. (2006). Enhancing Parent-Teacher Communication Using Technology: A Reading Improvement Clinic Example.	technology to communicate with parents as a part of a reading tutoring program.	progress and tutoring artifacts with parents. The WebCT environment was used to send informal notes to parents along with more formalized assessments and feedback. The focus was using technology as a primarily a means of communication between teacher and parent.
Pasternak, D.L. (2007). Is technology used as practice? A survey analysis of preservice English teachers' perceptions and classroom practices.	Teacher educator modeled how to use technology as practice—"to enhance content and become content" (Pasternak, 2007, p. 141) in the ELA classroom in a methods class and then studied the extent to which the preservice teachers transferred into field experience the use of technology as practice.	Surveyed preservice teachers to determine their beliefs about technology and the extent to which they incorporated it as practice in their field placements. Although the preservice teachers employed a variety of technology in their field placements, their evaluation of their technology uses focused more on the logistics and technology management issues than on how effective and meaningful these uses were for teaching the English language arts. Findings indicated that preservice teachers needed ample experience in methods courses in evaluating critically the effectiveness of various technologies to teach the English language arts in order to transfer those skills into field placements and beyond.
Shoffner, M. (2007). Preservice English teachers and technology: A consideration of weblogs for the English classroom.	Explored the "how" of teaching ELA with technology in her teacher education classroom.	Using the TPACK framework (Mishra & Koehler, 2006), a teacher educator discussed how to help preservice teachers to develop "a working pedagogy" for technology integration (i.e. weblogs) for teaching and learning (Shoffner, 2007, p. 245). This approach involved helping preservice teachers with developing a reflective decision-making process to ascertain the benefits and challenges of incorporating technology, (e.g., weblogs) and "the pedagogical implications of their classroom decisions" (Shoffner, 2007, p. 245).
Hansen, C.C. (2008). Observing technology enhanced literacy learning.	Studied time of use and the types of technology that were integrated in the literacy activities of a second-grade classrooms. The researcher developed and tested the Observing Technology Enhanced	Prior to the study, the research participants engaged in a 60-hour professional development program designed to help teachers integrate technology in their classrooms. The researcher found that technology enhanced literacy instruction was predominantly done within the

Author(s), Year, & Title	Research Context	Critical Evaluation of Technology Integration
	Learning (OTELL) instrument in order to measure and record the teacher and student use of technology within the best practices of literacy instruction: pre-reading, reading, responding, exploring, and applying.	applying category of literacy instruction. This finding stressed the need to give educators more practice in using technology enhanced literacy instruction in the other aspects of literacy instruction, chiefly pre-reading and reading.
Wang, J. & Stallone-Brown, M.S. (2008). Automated essay scoring versus human scoring: A correlation study.	Analyzed the relationship between automated essay scoring and human scoring in order to assess the validity and reliability of Automated Essay Scoring (AES). Participants in this study were randomly selected developmental writing students in (N = 107) who were invited to take a standardized writing assessments. The participants' assessment were evaluated by both human scorers and an AES program.	Results from the study showed no significant correlation between the AES program and human scoring. There was a significant correlation, however, between the human raters from the two different writing assessments thus indicating that human scoring is more reliable and valid than the current AES software at that time. This study revealed strong implications on educational leaders' decision making in terms of choosing to utilize AES software and its cost effectiveness versus the more expensive, but more reliable, human scoring.
Woodcock, C. (2009). Fight the dragons: Using online discussion to promote critical literacy in teacher education.	Graduate students in a teacher education program participated in an online children and adolescent literature course. The instructor (author) designed online discussion where she modeled, gave suggestions, and scaffolded the discussion in each of the course modules, which had literature circle components to engage students in authentic discussions.	Analyzed online discourse in terms how it may be used to enhance critical literacy in an online literature course. The researcher argued it is important for teacher education programs to embed critical literacy components in order to assist in developing critical perspectives so the students may "counterbalance powers that may control students' literacy development" (p. 98). The author concluded that critical literacy and lenses should be included and developed in teacher education programs. This would give future educators a perspective to help their future students to articulate, face, and challenge, the injustices in their lived-worlds.
Heintz, A., Borsheim, C., Caughlan, S., Juzwik, M. M., & Sherry, M. B. (2010). Video-based response & revision: Dialogic	Presented a Video-Based Response and Revision (VBRR) assessment to use with preservice teachers in their final year of student teaching.	Presented a description of how a team of teacher educators aligned the theoretical and pedagogical frameworks of dialogical instruction with the praxis of situating the affordances of Web 2.0 technologies

Author(s), Year, & Title	Research Context	Critical Evaluation of Technology Integration
instruction using video and web 2.0 technologies.		within a preservice teacher education program. Teacher educators developed a set of Video-Based Response and Revision (VBRR) activities using Voicethread in teacher candidates' final year of teaching internship. The authors framed these curricular decisions around dialogic instructional practices where educators structure interactions to "foreground the responsive interweaving of voices in the classroom" (p. 176).
Hughes, J. & Robertson, L. (2010). Transforming practice: Using digital video to engage students.	Three preservice teachers from an ELA methods class to applied multiliteracies pedagogies.	Applied the four principles of multiliteracies pedagogy proposed by the New London Group (1996) as a guide for three preservice teachers enrolled in an ELA methods class. As a part of their class, the preservice teachers composed digital media projects focusing on important literacy events in their own lives. These digital media projects, thus, positioned the preservice educators as producers of new media rather than consumers. In analyzing the digital media projects, the researchers focused in "the representation of identity or the conceptual understanding of literacy teaching and learning" (p. 24). During the class, preservice teachers learned how to use, produce, and question technology in terms of new literacy education.
Miller, S.M. (2010). Reframing multimodal composing for student learning: Lessons on purpose from the Buffalo DV project.	Examined learning processes of both secondary teachers and their students in composing digital video in grade 6-12 classrooms.	Teachers were able to "expand their notions of what counts as literacy" (Miller, 2010, p. 203) while their students became engaged and active in the learning process. The researcher demonstrated how integrating digital video composition in the curriculum transformed the teaching and learning in the participants classrooms. Students were able to develop strategies for deep thinking and knowledge in applying their classroom learning to high-stakes test like graduation exams and extend their learning to the world.
Ruday, S. (2011). Expanding the	Secondary educator used online discussion boards	Evaluated pros and cons of using online discussion boards in middle

Author(s), Year, & Title	Research Context	Critical Evaluation of Technology Integration
possibilities of discussion: A strategic approach to using online discussion boards in the middle and high school English classroom.	as an alternative to face-to-face discussion in middle and high school.	and high school. The teacher educator recommended "a strategic approach" that recognizes the context affordances and constraints and uses this information in planning online discussion boards. Richards' (2000) questions were provided to assist teachers in ascertaining the appropriateness of online discussion boards in teaching.
Shanahan, L. (2012). Use of sound with digital text: Moving beyond sound as an add-on or decoration.	A teacher educator studied elementary students' use of sound in digital text and the support the teacher provided.	Although the teacher taught the students how to insert images and animations, she did not model for her students how to use sound (in combination with image, words, animations, etc.) to communicate effectively a message about acid rain. To address this missed opportunity and help teachers teach explicitly the use of sound in multimodal text, the researcher included guiding questions that invite students to examine critically sound choices available to them and how they can affect meaning and audience response. The article concluded that sound should not be seen as just an add-on, but as a central part of multimodal composing.

The majority of the authors engaged in a critical analysis of technology use for teaching and learning ELA, and they recognized the importance of context in their analysis. Most authors included information about their evaluative processes (Hughes & Robertson, 2010; Merkley, Schmidt, Dirksen, & Fuhler, 2006; Miller, 2010; Pace, 2001; Shoffner, 2007). A few incorporated issues of power, access, and equity as well as considerations of educators' own technology expertise (Pasternak, 2007; Shoffner, 2007).

Many researchers and teacher educators made a distinction between technical competence (the technical know-how) and pedagogical technology knowledge — that is, knowing how to use technology to teach ELA, its content, skills, and processes (Bush, 2002; Hansen, 2008; Pace, 2001; Pasternak, 2007; Shoffner, 2007). As Bush (2002) argued, such an evaluative stance requires a shift from technical competence to critical evaluation competence through the questions educators should ask of themselves when making decisions about technology integration in the classroom. In teaching these elements to preservice teachers, many teacher educators offered a variety of frameworks, such as the Technological Pedagogical and Content Knowledge (TPACK) framework (Mishra & Koehler, 2006), the New London Group's Pedagogy of Multiliteracies (1996), or Pope and Golub's (2000) Principles.

In addition, many authors targeted critical literacy components in addition to multiliteracies and dialogical frameworks (Heintz et al., 2010; Hughes & Robertson, 2010; Miller, 2010; Woodcock, 2009; Young, 2004). In grounding the research in seminal literacy frameworks as well as providing clear descriptions and models of how to incorporate critical literacy and multiliteracies pedagogy within technology infused classes, these researchers provide valuable insight to teacher educators, preservice, and in-service educators.

Some researchers offered insight about the reliability of using technology to assess or measure literacy activities such as reading and writing practices. For example, Wang and Stallone-Brown (2008) evaluated the reliability of using Automated Essay Software (AES) in assessing student writing while Hansen (2008) developed an instrument researchers could use to measure how both teachers and their students use technology in reading activities within their classrooms. While helpful for decision-making in some respects, these articles did not offer a strong response to social justice issues inherent in relegating writing assessment away from humans who know students toward a machine. For example, there are arguments that either scenario (human grader or machine grader) could be more just, but there was little engagement with these perspectives. Although they evaluated the tools and digital technologies, authors did not take up the ways in which critical evaluation also affects issues of equity and social justice in the ELA classroom.

Principle 5: Providing a Wide Range of Opportunities to Use Technology

Pope and Golub (2000) described the need to "provide diverse experiences and perspectives" (p. 93) through the infusion of "opportunities for students to learn to work the technology itself and to develop those technological skills through the study of English language arts content as well as the English language arts content pedagogy" (p. 93-94). They addressed the need for teacher preparation programs to incorporate activities where ELA was integrated with technological tools. Their examples included "reading the Internet" (p. 94) and participating in online discussions. While revisiting Pope and Golub's (2000) initial principles, George, Pope, and Reid (2015) addressed the need to maintain this focus on exploring different technologies with preservice teachers. George, Pope, and Reid (2015) offered new digital technologies that built off of the foundational article, and advocated for the use of blogs and wikis to communicate. They also called for the exploration of ethics in the use of hardware such as videos and cameras with preservice teachers.

Eight articles explicitly addressed and investigated Pope and Golub's (2000) Principle 5 and reported on the use of a wide variety of technology. All articles were published prior to George, Pope, and Reid's 2015 article that addressed the need to maintain the focus on this principle (see Table 5).

Table 5
Providing a Wide Range of Opportunities for Technology Use Across 17 Years of *CITE Journal*.

Author(s), Year, & Title	Research Context	Wide Range of Opportunities to Use Technology Addressed
Medicus, D. & Wood, S.N. (2000). The power of technology to inspire students and teachers	A pedagogical perspective on technology and technological	Shared a variety of technology tools that teachers can use in the classroom, including free fonts, Power Point, tape recorders, video cameras,

Author(s), Year, & Title	Research Context	Wide Range of Opportunities to Use Technology Addressed
in English Language Arts classrooms.	applications in the classroom.	and online journals. Ideas for incorporating oral histories, student reflection, and art are shared.
Solvie, P., & Kloek, M. (2007). Using technology tools to engage students with multiple learning styles in a constructivist learning environment.	Preservice teachers' use of technology in a reading methods course with a constructivist approach.	No link was found between learning styles and preference for different technologies. Researchers noted the importance of reflective activities to help students develop their metacognition, and called for further study of issues of power and technology in the classroom, including the selection of tools.
Woodcock, C. (2009). Fight the dragons: Using online discussion to promote critical literacy in teacher education.	Inservice teachers, through a graduate course on young adult literature, learned about critical literacy practices through online discussions.	Focused on the use of online discussion forums in a hybrid class as a way to utilize technology to encourage discussion about critical literacy practices within the context of technology. The course was divided into 10 modules where students were asked to submit at least 6 responses to an online forum per module.
McGrail, E., & McGrail, P. (2010). Copying right and copying wrong with Web 2.0 tools in the teacher education and communications classrooms.	Researchers taught several classes to both preservice English teachers and communication majors and infused concepts of Web 2.0 copyright laws into the coursework.	Authors addressed copyright rules and regulations in their course syllabi. The authors addressed Web 2.0 copyright laws with the following goals: "(a) to define and clarify the terms; (b) to check students' understanding of these terms in the context of Web 2.0 applications and their web-based dissemination; and (c) to prepare them for the legal use of material accessed online in their own artistic creations with Web 2.0 tools" (p. 264).
Ruday, S. (2011). Expanding the possibilities of discussion: A strategic approach to using online discussion boards in the middle and high school English classroom.	Theoretical perspective of possible middle and high school students use of online discussion boards.	Offered affordances and limitations of using online discussion boards in theory. Affordances included less teacher control and ability to ponder a response thoroughly before submitting. Limitations included access and time. Online discussion boards included multiple modalities.
Pope, C., Beal, C., Long, S., & McCammon, L. (2011). They teach us how to teach them: Teacher preparation for the 21st Century.	Teacher educators, preservice teachers, and middle school students at a magnet school participated in a three-year time project on *The Outsiders*.	Students were assigned to respond to *The Outsiders* by composing a song about the novel. Students used music, digital video, and student-led presentations as part of the composition process. The researchers found three themes: middle school students want to learn, all students can

Author(s), Year, & Title	Research Context	Wide Range of Opportunities to Use Technology Addressed
		contribute, and students like books that speak to them.
Nobles, S., Dreger, K., & Gearhart, M. (2012). Collaboration beyond the classroom walls: Deepening learning for students, preservice teachers, teachers, and professors.	Reported the impacts of a partnership between a high school teacher, a teacher educator, and a preservice teacher carried out via technology due to their geographically distant locales.	A high school teacher's students and a preservice teacher discussed Shakespeare's *The Tragedy of Othello, the Moor of Venice* online using a Ning. The Ning allowed for threaded discussions that participants could respond to. Then, high school students posted drafts on their papers analyzing *The Tragedy of Othello*, and the preservice teacher gave them feedback in order to guide the high school students towards college writing expectations. The preservice teacher assessed the students' final papers. Participants reported value in the collaboration afforded by the technology.
Wake, D., & Whittingham, J. (2013). Teacher candidates' perceptions of technology supported literacy practices.	Preservice teachers' perceptions of various technology use in the K-12 context.	Authors collected the perceptions of secondary and elementary level preservice teachers regarding various technologies and their impact and influence on K-12 education. These technologies included blogs, wikis, digital storytelling, Voicethread, Glogster, and Prezi. Results indicated that preservice teachers have an increased knowledge of the technologies available to support literacy development at the K-12 level.

In exploring these eight articles, several strengths were evident. First, most of the articles focused on using digital technologies to connect with others and other forms of collaboration. Second, the articles' emphasis on a wide variety of technology usage provided theoretical background that could prove helpful to those researching and teaching with technology (Nobles, Dreger, & Gearhart, 2012; Pope et al., 2011; Ruday, 2011).

Much of the theory building was predicated on the tension between the panoply of tools and the importance of strategy and planning. In these articles, a few authors directly touched on the affordances of a wide use of technology and leveraged it to address power structures (Ruday, 2011; Solvie, & Kloek, 2007). For example, Pope et al. (2011) gave middle school students a wide range of opportunities to practice with several digital tools while making a music video that reflected their reading of a Young Adult novel. Likewise, Wake and Whittingham (2013) promoted the power of digital technologies in ELA classrooms through a myriad of opportunities to use a wide range of tools.

Although authors did not explicitly take up notions of social justice, the articles detailed the ways in which learners were given agency by choosing their own tools and digital technologies. Authors advocated for equity by supporting participants in identifying their own values and purposes so that they could make the best decisions for themselves.

Principle 6: Examine and Determine Ways of Analyzing, Evaluating, and Grading English Language Arts Technology Projects

Pope and Golub (2000) emphasized the need for new ways to assess student work in Principle 6. They acknowledged that the continuing emergence of new genres and forms called for new ways to evaluate students' processes and the quality of products. Notably, Pope and Golub (2000) advocated for teachers to partner with their students and look at models to co-develop assessment criteria. This cocreation of assessments is an attempt at crafting a more equitable and democratic classroom.

George, Pope, and Reid's (2015) revisited discussion of Pope and Golub's (2000) principles and called attention to the prevalence of testing and standards tied to computer-based assessments. George et al. (2015) recommended that teacher educators continue to "make our grading transparent when reviewing students' presentations" (para. 9, section *The Principles in 2015*). Nine articles addressed evaluation and grading of ELA technology projects. Table 6 summarizes these articles.

Table 6
Analyzing, Evaluating, and Grading English Language Arts Technology Products Across 17 Years of *CITE Journal*

Author(s), Year, & Title	Research Context	Issues of Analyzing, Evaluating, and Grading ELA Tech Addressed
Black, A. (2005). The Use of Asynchronous Discussion: Creating a Text of Talk.	Discussed asynchronous online discussions within both undergraduate and graduate literacy courses for teachers.	Online asynchronous discussions needed to be considered both a process (of reflection) and an assessment (of the final product). Author considered how the communicative practice of asynchronous discussions in an online class fit within the social constructivist paradigm, and subsequently how that impacted production. She also identified specific assessment practices, such as requiring students to post responses at least three times.
Hansen, C.C. (2008) Observing technology enhanced literacy learning.	Three, second-grade teachers' classrooms were examined to track the teachers' and students' technology use.	The author developed an observation instrument to record second-grade teachers' and students' use of technology during reading instruction. Technology used was classified among five essential components of reading instruction (e.g., pre-reading, reading, responding) and categorized according to the type of technology used (e.g., PowerPoint, electronic books).
Wang, J. & Stallone-Brown, M.S. (2008). Automated essay scoring versus human scoring: A correlational study.	Analyzed the human and automated essay scores for 107 randomly selected undergraduate students enrolled in a	Results did not show a correlation between AES and human ratings for overall holistic scores and concluded that AES is not a reliable method for assessing writing.

Author(s), Year, & Title	Research Context	Issues of Analyzing, Evaluating, and Grading ELA Tech Addressed
	developmental writing course.	
Shoffner, M. (2009) "Because I know how to use it:" Integrating technology into preservice English teacher reflective practice.	An English educator analyzed their students' choice of medium for a digital reflective journal assignment.	Preservice teachers used technology during informal reflective journaling about their practice. The author tracked participants' choice of medium for their reflective journals (e.g. Word doc, email, blog), and analyzed students' reflections on their choice.
Figg, C., & McCartney, R. (2010) Impacting academic achievement with student learners teaching digital storytelling to others: The ATTTCSE digital video project.	Teachers accompanied 14 African American students and a student-selected family member to a summer enrichment program. Students taught their family member how to create a digital story.	Quantitative evaluation of the pre- and post-technological expertise of the student through a survey, and also analyzed the effects of the experience on participants through observations, interviews, and reflections.
Butler, D., Leahy, M., & McCormak, C. (2010) Redefining book reviews for the digital age.	Teacher educators conducted a study on the effectiveness of the online book review project in the Irish primary school context.	Criteria for evaluating the book review presentations included rate of speech and volume and speaking with expression or stating the favorite part of the book. These criteria were co-developed by the teacher with the students after the appraisal of student book review samples. This process was integrated into instruction in the form of self and peer evaluations. The rubric or a scoring guide, with specific levels of performance, was not included.
Heintz, A., Borsheim, C., Caughlan, S., Juzwik, M. M., & Sherry, M. B. (2010) Video-based response & revision: Dialogic instruction using video and web 2.0 technologies.	Teacher educators reflected on working with the preservice teachers who use various technologies in the field placement to help them evaluate their own and others' technology uses.	Preservice teachers used video, Voicethread, and collaborative feedback to critique and help each other improve their future lessons. Video and Web 2.0 networking technologies combined with dialogic instruction provided new ways of analyzing and evaluating (Pope & Golub, 2000) their own teaching and practices of others. There was, however, no discussion of the grading policy the teacher educators used to assess the quality of the technology-mediated products and the inquiry process in which these preservice teachers engaged.
Miller, S.M. (2010). Reframing multimodal composing for	Teacher educator examined the secondary teachers' (in collaboration with the	Addressed Pope and Golub's (2000) analysis and evaluation element of Principle 6 as one of the values within the multimodal literacy pedagogy framework

Author(s), Year, & Title	Research Context	Issues of Analyzing, Evaluating, and Grading ELA Tech Addressed
student learning: Lessons on purpose from the Buffalo DV project.	university teacher educators) learning how to integrate into the curriculum digital video composing tools. Teacher educator support extended to help the teachers how to use these tools with their students in their classrooms.	he offers to help preservice teachers improve their teaching and student learning. Preservice teachers used the framework to design and critique their multimodal compositions. However, what the actual "critique of multimodal texts" (p. 197) involves and how it can be evaluated were not discussed nor illustrated.
Sanden, S. & Darragh, J. (2011) Wiki use in the 21st-century literacy classroom: A framework for evaluation.	Teacher educators evaluated and critiqued various uses of wikitext for literacy education by in-service teachers, pointing out to the effective and not so effective uses from the ELA classroom, elementary through high school.	Blended the 2008 NCTE position statement, Lankshear and Knobel's (2006) work, and Cummins, Brown, and Sayers (2007) criteria into the framework they proposed to assess the use of wikis in the classroom. Although the review of the student wiki examples often focused on critical analysis to determine the appropriateness or trustworthiness of a particular text or whose voice it advanced, performance levels to evaluate the quality of wikis themselves were not provided.
Ruday, S. (2011) Expanding the possibilities of discussion: A strategic approach to using online discussion boards in the middle and high school English classroom.	Teacher educator used existing research, theoretical pieces and position papers, as well as practical articles, to extract the guidelines for evaluating the use of online discussion boards in the middle and high school ELA classroom.	Based on the emergence of New Literacies, the author of this article explored the affordances and constraints of online discussion boards as sites to expand class discussions. The primary focus of such evaluation is to determine when and how to use online discussion boards, as opposed to determining the criteria to assess the quality of a particular online discussion. This focus is aligned more closely with Principle 4 than Principle 6.

For articles addressing Principle 6, half of them directly and extensively included the critical analysis and evaluation aspects that attend to social justice issues. In these particular articles, researchers engaged their students in critical analyses of their own processes and products. Students received feedback in a variety of forms on their work throughout the process, including critiques from the teacher, peer editing, and self-evaluation. In one article, the teacher and the students coconstructed the general guidelines and criteria for evaluating the technology use and the quality of student products (Butler, Leahy, & McCormack, 2010). Activities such as this exemplified social justice practices in action. The students and the teacher stood on more equal footing and negotiated their goals and what constituted acceptable evidence that goals were met.

Some researchers referenced existing frameworks to develop their evaluation criteria. These frameworks included New Literacies and Pope and Golub's (2000) Principles (Ruday, 2011), the NCTE 2008 position statement (Sanden & Darragh, 2011), and multimodal literacy pedagogy (Miller, 2010). In articles that addressed this principle,

researchers conducted their research with varied populations, including teacher education and the ELA classroom contexts, elementary, middle and high school. Last, many of these articles successfully employed rich data collection methods such as interviews, observations, and surveys, to gather students' reflections on their decision-making processes concerning technology integration choices in ELA instruction.

The most significant weakness with regard to Principle 6 is that the grading criteria (e.g., rubric, grading scale) used to assess technology products were not made explicit. It was unclear how student work described in these articles was graded. Even though general guidelines were often shared or even sometimes coconstructed with students, there were no scoring guides shared, or explanations of grading individual work. Performance rating scales or other measures to assess the quality of the final products were not discussed.

Principle 7: Exploring Issues of Equity and Diversity

Although it came as the last of the guidelines put forth by Pope and Golub (2000), this final principle specifically addressed research question two and provided the opportunity to focus exclusively on aspects of social justice and democracy. Pope and Golub (2000) acknowledged that access to digital technology was not the same for all teachers and all students in all contexts in Principle 7. These realities empower and constrain teachers as they work within their personal, professional, and technological resources to make curriculum in specific contexts (Rice, 2016).

When Pope and Golub's (2000) initial principles were revisited (George et al., 2015), new concerns were raised with regard to policies such as the rapid emergence of 1:1 device initiatives in some K-12 schools. In addition, George et al. highlighted the attention given to students with special needs and English Language Learners (ELLs). Ten articles made some discernable reference to issues equity and diversity. Table 7 summarizes these articles.

Table 7
Exploring Issues of Equity and Diversity Across in *CITE Journal*

Author(s), Year, & Title	Research Context	Issues of Diversity and Equity Addressed
Medicus, D. & Wood, S.N. (2000). The power of technology to inspire students and teachers in English Language Arts classrooms.	Secondary educator recommended general technology use to inspire secondary ELA students and teachers.	Cultural exchanges are listed as one of many ways to interest students in diverse perspectives. Authors also recommended gathering documents that address contemporary issues and local interest.
Carico, K.M. & Logan, D. (2001). The pull of participation: Multilogues in online literature discussions.	University students and middle school students connected virtually to discuss literature.	Emphasis was given to facilitating middle school students' access to an academic online discussion with adults studying at a university. District technology configurations had to be overridden to use the technology, Students' discussion centered on novels with diverse perspectives.

Author(s), Year, & Title	Research Context	Issues of Diversity and Equity Addressed
Myers, J. and Beach, R. (2004). Constructing critical literacy practices through technology tools and inquiry.	Collection of different technology tools used to encourage critical consciousness across different contexts, including a 10th grade classroom and a preservice teacher-middle school student collaboration	Depicted several practical ways in which to encourage critical consciousness and community agency – what the authors argued as paramount to the ELA curriculum. Perhaps the most fitting to a theme of diversity and equity is the example of middle school students and preservice teachers collaborating on the creation of media collages. This collaboration encouraged both middle school students and preservice teachers to explore how and why different media is created, inclusive of diverse audiences.
Figg., C., & McCartney, R. (2010). Impacting academic achievement with student learners teaching digital storytelling to others: The ATTTCSE digital video project.	Middle school students, facilitated by preservice teachers and their instructors, created digital movies representing their diverse familial histories.	To embrace familial narratives and histories, middle school students from diverse backgrounds, guided by university researchers, teacher educators, instructors, and preservice teachers, created digital movies about a very important person in their lives. This encouraged students to speak with their families about their own diversity and familial narratives, and impacted their relationships with family in a positive way.
Sanden, S. and Darragh, J. (2011). Wiki use in the 21st-century literacy classroom: A framework for evaluation.	Theoretical piece identifying an integrated framework in which sociocultural and pedagogical needs of students are met.	The imperative question that underlined diversity and equity was whether or not the technology used "advances students' social, emotional, and identity development by giving students agency, ownership, and/or personal voice" (p. 8). The authors then used wikis as an example of a technology that fit the integrated framework they proposed.
Brass, J., and Mecoli, S. (2011). The (failed) case of the Winston Society wikispace: The challenges and opportunities of Web 2.0 and teacher education.	Masters level in-service teachers participated in a wikispace dedicated to discussing progressive politics in education	Modeled after concepts in Orwell's *1984*, the Winston Society wikispace allowed for participants (primarily Masters level in-service teachers) to discuss the ways to "fight big brother" (p. 152); in this case, an allusion to the Department of Education. While no specific issue of equity was addressed explicitly, the concept of discussing educational politics in an open forum allowed for the possibility of this discussion. However, the researchers viewed the wikispace as a failed endeavour since the teachers were unable to find the

Author(s), Year, & Title	Research Context	Issues of Diversity and Equity Addressed
		time they needed to engage with the wiki.
Baecher, L., Schieble, M. Rosalia, C., & Rorimer, S. (2013). Blogging for academic purposes with English language learners: An online fieldwork initiative.	Preservice teachers engaged in a field experience at a large urban school with underserved students and blogged about their experiences preparing students for high stakes testing.	The context of an underperforming urban high school opened issues of equity. However, the students were not using the blogs, the teacher candidates were. Further, the focus is on ensuring students meet testing goals rather than receive more equitable opportunities to learn with digital technologies.
Shoffner, M. (2013). Editorial: Approaching technology in English education from a different perspective.	Teacher educator discussed how preservice teachers are prepared to use technology as part of pedagogy	The article included one paragraph where inequity of devices and access are acknowledged; the focus of the article was getting preservice teachers to integrate learning from coursework into practice.
Sherry, M.B. (2014). The student writing archive project (SWAP): Designing a searchable database of student writing and teacher commentary for English teacher preparation courses.	A teacher educator created online database for feedback on writing for preservice teachers.	The author created a database of student writing focused on diverse students. The purpose of the article was to give preservice teachers opportunities to see writing from more students.
Laughter, J. (2015). ELA teacher preparation 2.0: Critical media literacy, action research, and mashups.	Teacher educator performed action research with technological tools to help students learn critical media literacy.	The author made explicit references to taking up critical media literacy to promote social justice among preservice teachers so that they would address those issues with students.

In exploring the trends in the articles addressing social justice in Principle 7, secondary students were included in several of the studies (Carico & Logan, 2001; Figg & McCartney, 2010; Myers & Beach, 2004). These studies had specific aims to bring preservice teachers and secondary students into meaningful interaction with technology. No studies that incorporated elementary level students were present (although ELA was often considered a 6-12th grade context), which could (and should) be addressed.

In addition, many of the articles included a wide variety of expertise, from practicing teachers to educational researchers and teacher preparation instructors. Therefore, these articles offered multiple points of view over a span of years of *CITE Journal*. In several of the articles, traditional assignments, such as reading *The Joy Luck Club* (Tan, 1989), were given an educational facelift using technology to address social concerns (Carico & Logan, 2001). Arguably, the use of updating traditional assignments using technology is a less-sophisticated use of technologies. Even so, it is important to consider that teachers were trying to work within their sociomaterial realities.

There were some limitations and gaps across the articles reviewed. The most obvious of these was simply the number of articles that were explicit about their social justice goals. While we chose to include several articles that implicitly connected concepts of equity and diversity with technology and ELA instruction, only 10 of these articles truly focused on the concepts of equity and diversity as a central theme. There were commentaries that emphasized this need as early as 2006 (Drucker), but not many scholars attended to this gap. The special issue on equity and social justice begins to explore and attend to this gap — more research in this area is needed.

Another concern was the lack of focus on engagement with diverse students as participants. While it was laudable to invite young people into inquiry regardless of whether they represent some diverse status, if there are not real attempts to focus on technology as a way to engage with diverse students, then equity and justice may be lost entirely from conversations about technological integration. ELA teacher education researchers cannot claim to address diversity in the literature they produce without studies in which diverse students are included and highlighted.

While some scholars made space for bridged practices between prospective teachers and middle and high school students, there were still few descriptions of real connections between anticipated practice teaching with technologies and preparation experiences. Unfortunately, that means that there is still little connection between ELA teacher preparation for technology and teaching in physical spaces. While teacher preparation programs might be preparing prospective and practicing teachers to *use* digital technologies, the prospective teachers were not necessarily ready to *teach* with these technologies.

The most obvious gap was the lack of theorization around terms like "equity," "social justice," and "access" in these 10 studies of ELA teaching with technology. Instead, what emerged were limited conversations about personal voice and agency. For example, Medicus and Wood (2000) stated that the students "have participated in global conversations" (p. 237) when discussing the benefits of various technologies and cited the potential for a stronger curriculum when technology is used, such as showing a Native American portrait while studying Chief Joseph's speech. While these strategies can lend themselves to culturally relevant pedagogy or social justice, these suggestions form actionable steps without a grounding theory or framework.

Others, like Sherry (2014), nodded toward the need for equitable resources, but also lacked the theorization or framework for introducing, discussing, and teaching within a social justice paradigm. Sanden and Darragh (2011) used terms like "identity development" (p. 8) and "student agency" (p. 8) but, too, failed to ground them in scholarship on equitable practices. These examples are not meant to lay blame but rather raise a question of whether or not a clear framework exists for attending to and teaching notions of social justice when utilizing digital literacies. What would have been helpful is more discussion of contextual factors that commingle or interact with individual factors within a context to produce ELA classrooms where student diversity is expected, acknowledged, and honored through engagement with digital literacies.

Implications and Themes

A number of themes emerge throughout this review of *CITE Journal* (English/Language Arts Education) scholarship, all of which collectively help tell a story of digital technologies and ELA while pointing to the need for the journal to more fully incorporate social justice. Many articles explicitly call for greater equity across the board, including access within

institutions (Warschauer et al., 2004), participation in K-12 and university settings (Rice, 2016), professional development opportunities for prospective and practicing teachers (Figg & McCartney, 2010), and more. Other selections indirectly address the issue of equity by showcasing diverse student populations or discussing school policies attempting to provide greater access (Pasternak, 2007). In some cases, the research methodologies and theoretical frameworks reveal, perhaps inadvertently, the remaining distance between our current efforts and a shared vision of justice (Brass & Mecoli, 2011). While all seven principles make various contributions in this story, the journey toward equity is visible in three central themes: accounting for the multiple threads of technology implementation, enacting a critical digital pedagogy, and reimagining the work of teacher educators.

Consolidating Multiple Arcs in ELA Technology Implementation Research

As the arc of technology implementation in ELA has played out, we are at present operating within and across at least three parallel threads. These threads may diverge in the near future as researchers, teachers, and teacher educators begin to fracture their initial notions and perceptions of digital literacies. Yet, there are some commonalities among the three threads, even as we are still evolving what it means to be a digitally literate citizen.

First, many researchers continue to approach technology as a platform through which traditional literacy practices can be enhanced, such as reading and writing about literature, identifying main ideas in texts, increasing reading comprehension, and more (Cook & Bissonette, 2016). An interest in digital devices as support tools for effective teaching and learning persists and demonstrates staying power as a result of the steady wave of new applications and websites that are consistently being explored (Smith et al., 2017). The articles revealed a number of potential problematic outcomes with this view, including the use of technology to merely update print-based approaches with the efficiency of digitized texts or perpetuate status-quos in institutions' assessment practices (Zoch et al., 2016).

Despite these dangers, scholarship examining the role of technology in teaching ELA concepts still has an important part to play in striving for equity, especially studies which clearly define and describe both effective and ineffective implementations and represent the perspectives and experiences of all stakeholders (Shoffner, 2007). It is essential to continue to emphasize the interdisciplinary nature of ELA, considering digital technology as one aspect of the ELA curriculum that requires critical literacy, not simply as tool or platform.

Second, a growing interest is evident in the notion of digital technologies as literacy — with implications not only for breaking new ground in ELA curriculum and instruction, but also for applications in interdisciplinary contexts across content areas and institutions (Lynch, et. al, 2018). This thread is deceptively complex; at first thought, considering digital literacies as a means for ELA "doing" as opposed to a means for *supporting* ELA "doing" appears simple enough. Teaching ELA objectives with the use of technology is engaging in instruction with the support of technology rather than utilizing technology in such a way that digital literacy becomes inclusive in our definitions of traditional ELA objectives and standards. However, investigating implementation as complete replacement, both in product and process, complicates traditional conceptions of technology and teaching and may invert the relationship altogether. This thread is well-positioned to help practitioners and researchers explore issues of equity moving forward, given the increasingly digitized and interdisciplinary contexts of our ELA classrooms. In addition, new spaces for the blending of methodologies are imaginable, particularly when considering recent trends in exploring coding and algorithmic processes that feature the actual language and literacy of technology (Lynch, 2017).

Third, at the turn of the century, practitioners and researchers alike began applying a poststructural, critical lens toward technology implementation (McGrail & McGrail, 2010). While many new teachers who actively integrated technology in ELA curriculum and instruction combined with veteran teachers who were hesitant about modifying their approaches to create a pedagogical divide, new questions were being asked about the ethics of digital literacies (Myers & Beach, 2004). Explorations of technology to what end, for whom, and under what circumstances now occupy a large portion of scholarship at a range of learning levels (Laughter, 2015).

The scholarship, and the teachers who implement it, have moved beyond the novelty of technology and instead have become more critical toward its implementation; recent scholarship considered the *why* and *when* versus the *what* and the *how* of implementing technology in the ELA classroom (Woodcock, 2009). The purpose and appropriate timing of technology implementation hinges on investigating the appropriate audience —further, it requires the educator and researcher to tease out nuances that might affect diverse populations. A philosophical perspective considering the ethics of digital learning, then, is well-positioned to impact equity and diversity moving forward because its lens is widened to recognize the notion that contexts always matter in any empirical critique. Justice-driven approaches to studies of technology in ELA scrutinize important factors often overlooked in research designs including diversity of populations, reliability of access, and sustainability of outcomes.

Supporting the Arc in ELA Teacher Education

Spaces of teacher education are positioned to impact both the numerous threads of equity-driven technology implementation as well as aspects of a critical digital pedagogy because of the opportunities they afford for teacher educators to address a number of significant gaps, including the divide between theory and practice and the division between traditional literacy practices and contemporary meaning-making (Kajder, 2006). In addition, Ruday (2011) acknowledged that access issues present challenges but insisted that teachers should not let that deter them from integrating technology. Students who do not have access at home benefit from using it in the classroom. Teachers should take into account the access that students have at school and at home and they should talk to parents and administration. Ruday stated,

If many students do not have access to online discussion boards at home, or if there is considerable disparity in access levels, then teachers should limit the use of online discussion boards to in-class activities, where all students have equal access. (n.p.)

While most articles in this review framed technology integration from the standpoint of content area specialists, there seemed to be a paradigm shift to incorporate the purview of digital literacies. Early innovators of technology integration were teaching themselves in order to teach their students, and modeling effective practices and perspectives prevailed as a significant need for both prospective and practicing ELA teachers (Sanden & Darragh, 2011). Reimagining our work as teacher educators involves a merging of these dimensions into a single framework.

At least three clear challenges emerge for teacher educators modeling digital literacies toward equity. First, most teachers, regardless of experience levels or backgrounds. tend to remain within their comfort zones when making curricular and instructional decisions and either intentionally or unintentionally replicate previous practices (Cook & Bissonette, 2016; Wake & Wittingham, 2013). Second, a focus on quality modeling must prioritize implementations of digital tools that are research-based and critical rather than simply

"new" (Shoffner, 2013). Finally, the most compelling of these articles revealed the importance of collaboration between and across institutions, which points to the promise of modeling when its effects are traced across contexts (Carico & Logan, 2001; Nobles, Dreger, & Gearhart, 2012; Pope et al., 2011)

Bending the Arc Toward Equity in Classrooms

As ELA teacher education embraces social justice in the classroom, the articles reviewed in this study suggest some important shifts in practice. In attending to principle 1, teaching technology in context needs to accommodate a wider definition of context (Ruday, 2011). In the studies reviewed, contextual considerations were focused on the technological milieu and not the backgrounds of the students or resources in the communities. Teachers should take these resources into better account.

For Principle 2, teachers and teacher educators were able to generate a long list of technological tools designed to expand literacies. To more fully merge social justice ideas into the standard, teachers should more actively involve students in where these tools come from, who has access to them at what cost, and what advantages and disadvantages exist (Cook & Bissonette, 2016; Zoch, Myers, & Belcher, 2015). For example, data privacy is an emerging concern, but such privacy is compromised every time students sign up for a new application. What data is collected and how it is used is an important literacy-orientated social justice component of tool use.

For Principle 3, researchers issued a clarion call for modeling, often arguing that modeling was a critical element of effective technological implementation (Kajder, 2006; Meyers, 2004; Tendero, 2006). Overall, there was tension in the articles about whether direct instruction and explicit modeling was preferable to workshop experiences where the teachers played with the tools and then modeled for one another. What was clear was that no authors thought that the ethos technology use required students to go out and troubleshoot entirely on their own. From these articles, it seems that teachers can draw on a variety of modeling philosophies and techniques and still attend to the research base.

The articles that attended to critical evaluation in principle 4 placed a heavy emphasis on frameworks such as the TPACK framework (Mishra & Koehler, 2006), the New London Group's Pedagogy of Multiliteracies (1996), or Pope and Golub's (2000) Principles. While it may indeed be useful to base critical evaluation on a framework, some of these frameworks lend themselves to social justice work better than others. For classroom teaching, teachers should consider drawing more explicitly on social justice theories for critical evaluation than the research has explored to this point.

While it was clear that researchers were trying to attend to the range of technologies in Principle 5, an obvious tension could be seen between using lots of tools and attending to context as part of Principle 1. The social justice space comes from helping the student choose from a range of tools that will fit their purposes (Ruday, 2011; Solvie, & Kloek, 2007). It should be the goal for teaching.

Principle 6 is about assessment. The articles explored the tension of building assessments that would be recognized as legitimate in spaces where traditionally, multiple choice tests are the standard (Ruday, 2011). Classroom teachers are in a bind in providing useful assessment feedback to students while they must also translate it into a grade. In a social justice frame, teachers might consider ways to resist this injustice by supporting students in grading themselves or by developing advocacy platforms with students to educate communities about the differences between assessment and grading.

Finally, Principle 7 specifically addressed issues of equity and diversity. Many of the articles were updated traditional assignments that came to include technological elements (Carico & Logan, 2001). In the research, students needed to be more involved (Carico & Logan, 2001; Figg & McCartney, 2010; Myers & Beach, 2004). In classrooms, generally, this is also likely the case. The young people should be primary users and producers of texts that use various technologies to support their creation and distribution in order to democratize the ELA classroom.

Conclusion

Although technology integration has snowballed since the inception of the *CITE Journal* and Pope and Golub's (2000) recommendations, foundational principles remain. ELA teachers still seek to engage students in the basic ELA content and to make that content relevant to students' lives. ELA teacher educators, likewise, seek to prepare teachers for a curriculum that still leans on the foundational skills of reading, writing, speaking, and listening. These primary tenets guide the integration of digital literacies and digital tools, as well as the work of the future.

As Hicks, Young, Kajder, and Hunt (2012) wrote after an examination of 100 years of *English Journal*, the work of English teachers has always been accompanied by a new text or a new technology. The newness of teaching is status quo. Hicks et al. wrote, "Things have always been different for the time in which teachers found themselves. They will continue to be. We must embrace that" (p. 73).

Examining the past 17 years of *CITE Journal* — years in which technology changed the world irrevocably — allows a moment to pause and reflect on future directions for ELA. In this future direction, social justice will not be an aside or addition to ELA but rather an integration that functions as a part of effective technology integration and good practice in the classroom. Looking back allows educators to step forward into a future that incorporates more voices, more diversity, more criticality, and more seats at the table. We advocate for an arc that bends toward more equity and uses of purposeful and meaningful digital technologies to engage all students.

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