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Chapter 8

Writing with Digital Tools

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> The digital era has negatively impacted grammar and writing skills. But it doesn't have to if K–12 schools do their jobs.
>
> —Anonymous Tweet

I am a moderately active Twitter user, mainly relying on the application (app) to build my professional learning network (PLN). The tweet above captured my attention while I was researching ideas for this chapter. I did not know the author, yet the words struck me so that I reread it several times, trying to make meaning of the message. I thought about the first sentence, the one about how digital tools impact grammar and writing skills, and pondered whether or not I agreed. Sure, the ubiquity of text-speak, "a form of written language characterized by abbreviations and typically not following standard grammar, spelling, punctuation, and style" (dictionary.com) goes hand in hand with the increased use of digital tools, especially when such tools constrain the writer to 280 characters. And yes, I have been known to cringe when a friend sends me a message that substitutes numbers for words (e.g., *4* instead of *for*). Yet, I understand the need for conciseness and brevity in one's writing when communicating in the 21st century. I also recognize the importance of understanding social settings and the fact that some digital landscapes do not warrant traditional grammar structures.

I also reread the second sentence several times, focusing on the phrase "if K–12 schools do their jobs." If the purpose of school is to transfer knowledge in ways that allow children to become productive members of society (i.e., economic, cultural, social), then shouldn't 21st-century education

prepare students to read and write with the affordances of digital tools whether or not they conform to traditional norms? Digital tools like Twitter, Snapchat, Tumblr, and Instagram rely on photographs, video, images, sound, and truncated written language to communicate ideas. The versatility of communication modes is a unique attribute of today's technology.

To examine this idea further, I shared the tweet with a group of teachers who taught a range of grade levels and content areas and asked them to informally share their reactions. The majority agreed that many times students' grammar and writing skills parallel electronic dialogue, rather than traditionally printed text that reflects standard written English. From these teachers' perspectives, students seem to rely on autocorrect, write in short sentences with little detail, and use punctuation sparingly when engaging in out-of-school digital literacy practices. A middle school teacher explained, "Students spend so much time at home behind a screen talking to their friends via text or other social media that it translates to the writing they produce in school." However, the teachers were emphatic that educating students on the functional skills associated with technology, as well as the pragmatics of digital environments, is part of their job, one they take very seriously. As a high school English teacher explained, her students are taught to understand social media so they can delineate its norms from those used when communicating within school and other professional settings.

Thus, it *is* our schools' responsibility to teach students about different types of writing. This includes recognizing the various ways we communicate via "different technologies, modalities, and contexts" (Leu, Slomp, Zawilinski, & Corrigan, 2016, p. 42). In fact, researchers argue that writing instruction would benefit from leveraging what students learn from informal digitally mediated communication to more effectively prepare them for the inherent demands of writing in formal digital environments (Alvermann, 2011; Stone, 2007).

What are best practices for writing with digital tools? In order to answer this question, I took a two-step approach. First, unlike sentence construction, planning, argumentative writing, and revision, I was hard-pressed to find evidence-based practices (EBPs) that "show a positive effect on student performance across multiple investigations" using randomized control designs (Graham, Harris, & Chambers, 2016, p. 214). Therefore, I read reviews of research on EBPs in writing for students in grades 1–12 (Graham et al., 2016) and grades K–8 (Graham, Harris, & Santangelo, 2015). Interestingly, both highlighted the paucity of research on digital tools and writing instruction, referring only to the effects of word processing as a tool for composing (e.g., Morphy & Graham, 2012). Next, I examined the digital tools I wrote about in the two previous editions of this volume as well as the recent work I conducted on multimodal composition

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(e.g., Karchmer-Klein, Mouza, Shinas, & Park, 2017; Karchmer-Klein, Shinas, & Park, 2014). Using the EBPs in writing as guides (Graham et al., 2016; Graham, Harris, et al., 2015), I identified digital tools that can be seamlessly incorporated to facilitate the implementation of best practices in writing instruction.

The purpose of this chapter is to encourage educators to think differently about writing and its relationship to digital tools. To this end, the chapter is divided into three sections. I begin by defining digital text—the medium by which we communicate via digital devices. I argue that before technology can be used effectively as a tool in writing, teachers must recognize the unique characteristics of digital text (Karchmer-Klein et al., 2014). Next, I share a range of digital tools along with examples of how they can be used to support evidence-based writing practices in K–12 settings. It is important to note two caveats:

1. I contemplated the selection of tools to include in the third edition of this chapter. Given technology's rapid rate of development, I wanted to make sure the tools were timely and also applicable to a large audience with a range of technology experience. Therefore, some of the tools may be familiar while others are new. Hopefully either way, innovative approaches to their integration can be gleaned.
2. I recognize schools around the world have purchased large amounts of technology and districts' choices vary between iPads, Chromebooks, and other options (U.S. Department of Education, 2016). To make this chapter applicable to a large audience, I describe tools designed for different operating systems, but encourage readers to identify ones with similar capabilities that run on the system that matches their technology.

The chapter concludes by encouraging teachers to use digital tools to build a PLN to help them navigate the ever-changing digital landscape.

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Characteristics of Digital Text and EBPs in Writing

Schools around the world are equipped with a range of tools such as computers, cameras, tablets, and interactive whiteboards (U.S. Department of Education, 2016). Although different devices, they share a common medium: digital text. The unique characteristics of digital text can be leveraged to support EBPs in writing (Graham et al., 2016).

Digital text is multimodal. Modes—such as words, images, animation, hyperlinks, or sounds—are signs that carry meaning (Cope & Kalantzis,

2015). Multimodality is the use of multiple modes within a text, and when integrated effectively results in a cohesive message. Jewitt (2014) suggests four assumptions that undergird our understanding of multimodality. One assumption is that all communication is multimodal—that is, although we tend to prioritize written language in teaching and learning, communication can be represented through a variety of linguistic and nonlinguistic modes. A second assumption is that each mode serves a unique purpose requiring writers to make informed choices regarding modal representation. Third, multimodality is intentional. In other words, writers must consider how modes complement and "co-present" a communicative event (Jewitt, 2014, p. 16) so as not to contradict each other. Finally, multimodality is a social act interpreted by social norms. For instance, a writer may use flashing images to indicate that each image must be clicked on to forward the progress of a digital story. If the reader is unfamiliar with flashing lights, he or she may not realize they are used to draw attention, indicating a portal to another digital space.

Another characteristic of digital text is that it tends to be nonlinear. By incorporating hyperlinks and other modes, writers can guide their readers down varying paths. Alternatively, readers can develop their own reading path, perhaps leading them to a different understanding of the text than the author intended. Valerie Shinas and I found this to be the case in our own research when examining digital text designed with a virtual poster tool (Karchmer-Klein & Shinas, 2012). Participants inserted arrows as textual scaffolds to guide the reader down the writer's path. However, some posters did not include such textual scaffolds, leaving readers to develop their own reading paths, which in several instances hindered their comprehension of the writer's intended meaning. To develop 21st-century readers and writers, we must prepare students to work within nonlinear writing structures so they understand how these dynamic texts affect comprehension.

Digital text is also malleable, enabling writers to continuously revise content and change background colors, font styles, and the placement of graphics to determine the best format for their writing. This is a much different capability than traditionally printed prose that is typically sent to editors for proofreading and formatting. In digital environments, what one person reads on Monday may be different from what another reads on Tuesday.

A fourth characteristic of digital text is that it is easily shareable and publishable on the Internet, the global computer network serving billions of users. This is beneficial to writers who want to write collaboratively or project their message to a large audience. In fact, teachers report an increase in students' motivation to write well when they have opportunities to revise their work based on peer feedback of online publications (Lapp, Shea, & Wolsey, 2010). By inviting critique from outside audiences via the

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Internet, writers may recognize the social context of their work, leading them to consider different perspectives on their ideas and to think more deeply about how best to approach revision (Castek, Beach, Cotanch, & Scott, 2014).

The characteristics of digital text make it a rich conduit to implementing best practices in writing instruction. For example, to be college and career ready, students must be able to work collaboratively (National Governors Association Center for Best Practices & Council of Chief State School Officers [NGA & CCSSO], 2010; Schriver, 2012). Research indicates collaborative writing experiences have positive effects on students' writing skills (Graham, Harris, et al., 2015). There is also a solid foundation of research demonstrating the positive effects of feedback on students' writing skills (Graham, Hebert, & Harris, 2015). While the largest gains stem from adult feedback, peer feedback has been proven worthy as well (Boscolo & Ascorti, 2004; Philippakos & MacArthur, 2016). Publishing digital text using collaborative digital tools affords users the opportunity to work with peers across grade levels (Milman, Carlson-Bancroft, & Boogart, 2014) and disciplines (Castek & Beach, 2013) during different stages of the writing process.

Foundational writing skills are also critical to the development of successful writers. The Common Core State Standards (CCSS; NGA & CCSSO, 2010) and researchers define these as typing, spelling, handwriting, genre, and strategies (e.g., Santangelo & Graham, 2013). Yet foundational skills within digital landscapes extend beyond those defined within traditionally printed texts that privilege written language. Instead, we must rethink foundational literacy skills in light of the characteristics of digital text (Karchmer-Klein, Shinas, & Wise, 2015). Writing instruction should be systematically teaching students how to carefully select images, sounds, video, and other modes to compose cohesive ensembles (Jewitt, 2014). Digital tools provide excellent opportunities to design such lessons.

The next section of this chapter presents a range of digital tools along with examples of how they can be used to build foundational and collaborative writing skills. Importantly, some examples describe ways for teachers to practice with digital tools independent of their writing instruction for students.

Blogs

Weblogs, also known as blogs, are virtual spaces where writers share thoughts, ponder ideas, and pose questions using compilations of words, images, video, and audio. Two unique aspects stand out about this form of digital writing. First, blog authors take on the role of both writer and editor, making decisions about the content, layout, and language of their digital

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text. This differs greatly from the traditional publication process where editors dictate the presentation. Second, blogs enable readers to comment on entries, allowing relationships to form between readers and writers. This is an especially powerful affordance from a pedagogical perspective as it provides writers access and interaction with a wide range of audiences.

It is estimated there are over 450 million English language blogs (Technorati, 2011) covering a range of topics. Edublogs, the largest blog provider, reports over four million education-related blogs created by teachers and students on their platform. Previous work identified three types of blogs focused on education (MacArthur & Karchmer-Klein, 2010). One type are those blogs written by educators about the highs and lows of teaching. A good example is Stack of Marking (*https://stackofmarking.wordpress.com/about*), named as a Best Teaching Blog of 2017 by A+ Star Teachers, a teacher recruitment company. A former teacher and educational consultant in the United Kingdom, Tom Starkey writes about class issues, school behavior, and teacher well-being. His detailed posts describe work-related experiences that illustrate his view of the current state of schooling. George Couros shares a principal's perspective of education on his blog The Principal of Change: Stories of Learning and Leading (*https://georgecouros.ca/blog*). He chronicles his views of collaborating with stakeholders to meet the needs for all students.

Some bloggers choose to remain anonymous so they can share their stories while maintaining their privacy. Perhaps the most interesting compilation of anonymous blogs is found on the "Secret Teacher" section of The Guardian website (*www.theguardian.com/teacher-network/series/the-secret-teacher*). Educators are encouraged to submit ideas for anonymous posts for the purpose of "lifting the lid on teaching." Topics covered include lack of teacher appreciation, comforting students after a death of a classmate, to classroom distractions and the crush of creativity. Although these blogs detail personal experiences in education, their stories are relatable to many educators as evidenced by the numerous comments left by readers.

A second type of blog is written by educators who devote their time for the purpose of sharing advice and educational resources. With 250,000 followers, the Cool Cat Teacher blog (*www.coolcatteacher.com*) earned a Best Teacher Edublog Award in 2014. The accolades were not surprising given the blog was mentioned on several websites as I conducted research for this chapter. Blogger Vicki Davis worked as a high school teacher and now an educational consultant. Her site serves as a portal where readers can access a wealth of resources. For instance, last year she started a 10-minute teacher podcast where she interviews experts on important education topics. Likewise, Katherine McKnight, a former high school teacher, maintains a blog (*www.katherinemcknight.com/blog*) sharing

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important ideas and lessons about how to use technology to support writing development.

Educators' perspectives should not be undervalued when it comes to understanding technology integration. In fact, much of what we know about best practices in using the technology to support reading and writing is informed by exemplary classroom teachers who use technology on a regular basis (Karchmer, Mallette, Kara-Soteriou, & Leu, 2005). Their daily interactions with students, along with their interest in technology, puts them in an exceptional position to share critical insight into how the Internet can support writing as well as other disciplines.

A third type of educational blog includes those in which teachers and students work together to share content. Learning Is Messy, authored by Brian Crosby, an upper elementary classroom teacher and science, technology, engineering, and math (STEM) leader, is a great example of this. On the blog (*www.learningismessy.com*) you will find videos of teachers engaging in innovative STEM lessons as well as videos documenting students' community service projects. Importantly, the class assignments are described in detail, providing context from which to understand the process students engaged in as they planned, drafted, revised, and edited their final presentations (Graham, Harris, et al., 2015).

While one of the benefits of blogs is the interaction between reader and writer, many bloggers are disappointed by the few comments they receive in response to their posts. Through Internet searching, I found two exciting projects that target this issue through intentional collaboration. David Mitchell, the deputy head teacher at Heathfield Primary School in the United Kingdom, found the lack of interaction between reader and writer unsettling to students when they published work on the class blog. The comments that were made came from inside his school with few, if any, outside comments. In response, he created the concept of quadblogging (*http://quadblogging.net*). Quadblogging connects four classrooms from around the world, building an international community of children communicating. Each week one class is the focus and the students in the other three classes read and make "quality comments" on the classroom's posts. The students get to know one another and also learn about different places, customs, and cultures. Since its inception in 2011, 500,000 students have participated in quadblogging. You can go to the Quadblogging site to sign your class up to participate in this innovative collaborative project for the following school year.

The second project is titled the Student Blogging Challenge (*http://studentchallenge.edublogs.org*). Stemming from her own classroom blog use, Sue Wyatt partnered with Sue Waters and the Edublog team to design a project that would "connect student bloggers with a global audience while supporting teachers with their classroom blogging." The challenge, run

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twice a year, consists of 10 tasks. Some require students to research topics such as global warming, cultural differences, and food choices. Others are focused on digital literacy skills such as digital citizenship, cyber safety, composing thoughtful digital feedback, and multimodality (e.g., embedding sound and images). The final task is designed to bring the experience to a close by requiring bloggers to audit their work. A variety of prompts are provided to scaffold their thinking:

- "How many posts did you write?"
- "How many comments did you receive from classmates, teachers, or overseas students?"
- "Which post received the most comments? Why do you think that happened?"
- "Which post did you enjoy writing the most and why?"
- "Which web tools did you use to show creativity on your blog?"

A unique aspect of this project requires the blogger to ask a student or adult unfamiliar with his or her work to audit the blog by providing feedback on the weekly posts.

Teachers may choose to have their entire class join the challenge, but individual students are also encouraged to participate. Perhaps most exciting is the opportunity to mentor other participants. Once a student has participated in two challenges, he or she may register as a mentor. This role requires the mentor to regularly comment on a specific set of students' work each week. This ensures all participants receive thoughtful, timely feedback after publication.

Quadblogging and the Student Blogging Challenge give students opportunities to practice foundational digital skills while honing their collaborative writing skills.

Wikis

A wiki is a digital collaborative writing space where writers can incorporate a range of modes to share thoughts and ideas about different topics within a single digital text. Wikipedia is probably the most recognized. Created in 2001, it is an online encyclopedia meant to be revised by its readers. From a pedagogical perspective, wikis are especially useful tools because they maintain records of development and revisions, enabling teachers to document students' participation.

Innovative teachers integrate wikis into classroom instruction in many ways, from basic approaches to more sophisticated. For instance, Kathy Cassidy, a primary teacher from Canada, created a public wiki for the purpose of visually representing the number 1,000 (*http://1000names.*

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wikispaces.com/home). She asked her audience, "My grade ones and twos want to know what 1000 looks like. We are collecting 1000 names. Can you help us by adding your name to our wiki? Just click on edit at the top of the page, add the next number and your name AT THE BOTTOM, then click save." As of October 9, 2017, at 1:23 P.M., 2,212 people had added their names to the table.

Greetings from the World (*http://greetingsfromtheworld.wikispaces.com*) is a collaborative writing project that uses wikis and a virtual poster tool to share important content. Arjana Blazic, the creator, wanted to share her students' experiences in her home country of Croatia with the rest of the world. To do so, her students created glogs using Glogster, a Web 2.0 tool that allows users to create virtual posters combining text, video, images, and music (Karchmer-Klein & Shinas, 2012). She embedded these glogs on her classroom wiki and invited other schools to view them. She also invited students and teachers to create their own glogs about their home countries, states, and cities and post them to the wiki so her students could learn about different places and cultures. As of March 2012, 520 students from 19 different countries had created 300 glogs representing their home countries. Together, they have developed a dynamic compilation of resources from which others can learn.

Wikijunior (*http://en.wikibooks.org/wiki/Wikijunior*) captures the essence of true collaborative writing. It is a project geared toward children through age 12. Here you will find hundreds of books in various stages of the writing process. Students can choose one and add, delete, and revise sections to make it better. The site encourages writers to fact-check, proofread, and also create their own books. There is also a Wikijunior talk page where students can discuss changes and content with others.

Although not technically called a wiki, Google Docs affords similar collaborative opportunities. I recently taught a class on digital literacies and the majority of students, all practicing K–12 teachers, worked in classrooms that utilized this tool frequently. This was not surprising given the rise in Chromebook access across the country (Taylor, 2015). Perhaps one of the best ways to illustrate Google Docs is by watching this video posted by high school teacher Mr. Sowash (*www.youtube.com/watch?v=6vUkoRJ9YE8*). It depicts the process of 18 ninth-grade students writing a collaborative story while working independently on desktop computers in their school's computer lab. Mr. Sowash screen captured the story's development using Camstasia software and then converted it to an iMovie to share the process with other educators. The directions he gave the students illustrated the simplicity of the assignment:

- [Teacher] writes the first sentence to get things going.
- Every student adds one sentence to the story.

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- Students may not change anything that someone else has written (with the exception of spelling).
- Students should not write anything they would not want their mothers to read.

Of course, writing one story with 18 adolescents could be a disjointed task and the video does not represent the revising component of the process. However, once students understand the functional skills associated with Google Docs and practice with the collaborative aspects, they will become more versed in the process.

The above is certainly not an exhaustive list of ways to integrate wikis, but is meant to provide ideas to get you thinking about how to do so in your writing classrooms. It is also important to keep in mind that along with using this collaborative tool comes a number of issues. My colleague Skip MacArthur and I highlighted these issues in previous work and they are worth mentioning here (MacArthur & Karchmer-Klein, 2010). First, teachers must consider carefully what it means to collaborate on writing assignments in the classroom and how they will prepare students to divide the responsibilities associated with the tasks. Second, given the open nature of the writing process when using wikis, students must learn how to respectfully respond and revise their classmates' work. Third, teachers must consider appropriate evaluation methods when assessing collaborative writing pieces. While there are no definitive ways of negotiating these issues in all classrooms, I strongly encourage you to develop a plan for responding to them before you consider using wikis in your instruction.

Social Media Tools

The last edition of this chapter referred to micro-blogging and social networking as separate tools. Since 2013, the line between them has continued to blur, so for the purposes of this chapter I am combining them under the heading of "Social Media Tools"—that is, "forms of electronic communication through which users create online communities to share information, ideas, personal messages and other content" (Schauer, 2015, p. 3). Before sharing ideas related to these tools I must stress the importance of using them in safe and secure environments. Most schools have cyber-safety policies in place. These should be reviewed before opening an account that is connected in any way to a professional environment. Teachers must not only follow these procedures because they are required to do so by the school, but because it is critical to model for our students how to be safe and maintain privacy in digital environments.

School districts across the country have been utilizing social media for several years to keep parents, teachers, and students in direct communication

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with school-related events (Carpenter & Krutka, 2014). According to a survey conducted by the Pew Research Center (Lenhart, 2015), Facebook (41%) continues to be the most used social media platform by U.S. teens (ages 13–17), followed by Instagram (20%), Snapchat (11%), and Twitter (6%). Likewise, teachers continue to reimagine ways to leverage the affordances of these tools for classroom writing instruction.

Like blogs and wikis, social media tools are used to promote schools and showcase student work. Instagram is often used in these ways by telling stories through images and limited written text. For example, take a look at the official DC Public Schools' Instagram site (*www.instagram.com/dcpublicschools*). To date there are 2,039 posts and over 10,600 followers. One of the photos on the DC Public School site shows a teenager jumping in the air in front of the Eiffel Tower. The caption reads "More than 400 DCPS students are traveling on 22 study abroad trips all over the world this summer, entirely for free! The 8th grade Paris trip is off to an exciting start. #DCPSGoesGlobal." Followers of the site can comment on the posts.

Twitter asks users to answer the question "What are you doing?" in 280 characters or less. Teachers and writing organizations are taking advantage of this feature to help students practice writing concise messages that convey important points. Steve Rayburn, a college English teacher, engaged his students in a Twitter activity that required them to take on a character's persona. As they read *Dante's Inferno,* students posted tweets from Dante's perspective to his love interest Beatrice. The assignment required students to hone their writing skills by composing concise messages that conveyed deep meanings (Ladd, 2009). Similarly, students at the San Francisco School of Arts were encouraged to enroll in a Twitter Micro-Lit Contest, hosted by Unstuck, a nonprofit annual publication. Contestants could write a nonfiction, fiction, or poetry entry of 12 separate tweets of 280 characters or less. The winning piece would be posted on the publication's Twitter account. These types of activities require students to think deeply about the words they choose and participate in active language building.

Another way teachers are integrating social media in their instruction is by backchanneling, a real-time digital stream that allows students to respond to classroom discussions. Students use classroom Twitter accounts and other backchannel tools (e.g., TodaysMeet) to respond to, query, and summarize class content (Gabriel, 2011). For example, Chris Webb, a middle school teacher, explained on his blog how he observed sixth graders backchanneling as they watched a 50-minute video. The students were required to post questions they had about the content presented and also summarize portions of the video.

I observed Mrs. Arenstad's fifth-grade class engaged in backchanneling during a class read-aloud of Lois Lowry's *Number the Stars*. Mrs. Arenstad

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told me that she liked backchanneling because "it motivated the students and at the same time engaged them directly in the lesson, requiring them to think about the content and report on it during class time." The day of my observation the students were already familiar with backchanneling and using TodaysMeet, a free program that creates a safe space for students to discuss relevant content. The purpose of the lesson was to reinforce note-taking skills by summarizing and paraphrasing important episodes in the narrative text to recognize sequence and main ideas. Students were asked to listen to Mrs. Arenstad read aloud two chapters of the book and back-channel main ideas in the order they happened. At the start, Mrs. Arenstad reminded the students of her guidelines. These included:

1. "Be respectful of your classmates' comments."
2. "Stay on topic."
3. "Do your best to use conventional spelling, but it is not required."
4. "Focus on multitasking: listen, summarize thoughts, write."
5. "Pose questions you have about the text."
6. "Paraphrase your ideas in 280 characters or less."
7. "Add something new. Don't repeat what others have said."

As the teacher read the chapter, I watched as students listened intently and typed directly onto their laptops. At the end of the first chapter, Mrs. Arenstad projected the transcript onto the whiteboard so the class could review the notes so far:

> Annemarie is upset she does not know everything.—JOYCE
>
> She is upset but she is figuring out that it is part of being an adult.—MIKE
>
> I'm not sure she knows why. I think she is confused by what Uncle says.—LAUREN
>
> Annemarie was confused early in the day but as the day goes on she seems to put two and two together.—KIRSTEN
>
> She is becoming like her mother; an adult.—JOYCE
>
> Annemarie is also learning what it is like to say goodbye to someone who dies. They are making food and preparing the living room.—NATHAN

Together they prioritized the most relevant comments by developing a timeline of events from the chapter. They also highlighted questions that still needed to be answered. Mrs. Arenstad then read the second chapter and the students continued to backchannel. At the end of the reading, she again projected the transcript and the class reviewed the comments. Once

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this was completed, the students worked in small groups to compose summaries of the chapters. This example of backchanneling illustrates how it can be an integral part of the lesson by reinforcing content through collaborative meaning making. Backchanneling has become more popular recently because teachers recognize how technology can facilitate class discussions.

Edmodo, a social networking site for education, is similar to Facebook but it is a password-protected closed system. Once connected, students can participate in a range of collaborative literacy activities given the number of tools available. In fact, Edmodo could be considered a portal or "instructional hub" (Dobler, 2012) because it allows teachers to store a range of resources in one location, much like learning management systems (e.g., Schoology, Canvas).

I observed a seventh-grade teacher engage his students in an Edmodo-based lesson. The topic was the Mexican–American War. To begin, the students opened their laptops and their class Edmodo site as Mr. Reilly projected the site on the whiteboard and introduced the lesson. He explained that they would be using a variety of activities to think deeply about the conflict. The class reviewed the content covered the previous day, including an overview of the war and who was involved. Next, Mr. Reilly opened a link he had embedded in the Edmodo site, and as a class the students listened to "Saint Patrick's Battalion," a song about the Irishmen who fought against the U.S. army during the war. When the song was over, Mr. Reilly gave the students 2 minutes to use what they learned from the song to decide which side of the war they would fight on. Next, the students used the polling tool on Edmodo to post their decision. As a class they reviewed the poll's results and discussed the different perspectives. To close the lesson, the students were required to post a note explaining their position along with one reason to support their view. Tyler, one of Mr. Reilly's students, wrote:

> I would not switch sides. You can call me a coward, but the United States had a much stronger army. I would be too afraid to move to a weaker military. It is also cowardly to leave your own country.

Edmodo can be used in a multitude of ways to support writing, including activities such as literature circle discussions, peer editing, and pen pals. However, it is only as powerful as the teacher makes it.

Educational Applications That Support Writing

I continue to work in K–12 schools that are integrating educational apps into teaching and learning (Karchmer-Klein et al., 2017). Additionally, I teach 100% online courses in literacy. Each semester I search for new ways

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to present content in asynchronous environments and design instruction that leverages digital tools in ways that will challenge students' thinking about the course goals. I am constantly on the lookout for new apps that can be used to support these objectives.

Apps are software programs designed to support user content knowledge, productivity, presentation, and/or gaming in the content areas. The number of apps has increased dramatically since I wrote the second edition of this chapter in 2013. There are over 83,000 apps in the Google Play Store (Olmstead & Atkinson, 2015) and more than 200,000 education-related apps available in the Apple Store (Baig, 2018).

Content Apps

Content apps introduce or reinforce content. Skills are typically assessed as levels of difficulty are completed. Many have game-like interfaces requiring users to beat the clock, play against opponents, or earn points. For example, based on the CCSS (NGA & CCSSO, 2010), iTooch English incorporates a plethora of multiple-choice content-area questions organized by grade level within an interactive interface. Third grade, for instance, includes questions related to choosing words and phrases for effect, introducing a topic, stating and supporting an opinion, vocabulary usage, and parts of speech. Students can work in practice or test mode and the app maintains a running progress report. Additionally, the app provides instructional support if the student struggles with content. Recent research indicates that student learning is greatest when content scaffolds are available before and during game play (Tsai, Kinzer, Hung, Chen, & Hsu, 2011). iTooch English is an especially promising app given the interface, direct correlation to the CCSS, and the content support available to students. A list of noteworthy apps that fit in this category can be found in Table 8.1.

TABLE 8.1. Noteworthy Content Apps

Title	Skills
iTooch English	Range of ELA skills
Bluster	Vocabulary
Shake-a-Phrase	Vocabulary/parts of speech
Spelling City	Vocabulary/spelling
SAT Vocabulary Flashcards	Vocabulary
Mad Libs	Parts of speech
Super Sight Words	Sight words

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Presentation Apps

Presentation apps do not teach a skill or present information on their own. Instead, the teacher can design learning experiences that allow students to present their knowledge with these apps in creative ways (Beach, Anson, Breuch, & Reynolds, 2014). Show Me, for instance, is similar to a whiteboard where users can draw, color, and insert images and audio to represent ideas. I have seen Show Me used in the classroom at a simplistic level and I have also observed more complex integration, encouraging analysis of concepts and inferencing. For example, a basic implementation of Show Me was observed in a fourth-grade writing class where students were reviewing grammar rules. The teacher wrote a series of sentences on the whiteboard and asked students to "show me" the different parts of speech. The teacher called out a word and told the students to write *verb, noun, adjective, pronoun,* or *adverb* on their iPad. This method of using Show Me allowed the teacher to evaluate all of the students' knowledge of the topic at the same time since they were responsible for independently documenting their responses.

An example of a more complex use was observed when seventh-grade students developed Show Me presentations to illustrate the transformation of North America into the postapocalyptic world of Panem in Suzanne Collins's *The Hunger Games*. Students studied the geographical descriptions of the 12 districts presented in the book. Using the Show Me app, they presented their interpretations to the class in two ways. First, they drew concept maps, showing the relationships between the author's descriptions of the districts and the characteristics of the current North America. Second, they projected a map of North America and using the drawing features, drew lines to represent the districts' boundaries. In this example, the app's affordances allowed students to conceptualize the content and visually represent their interpretations in meaningful ways.

Another type of presentation apps are screen capture tools, such as Screencastify and Quick Time. Research has examined their use when documenting students' thought processes when reading (White, 2016) and solving math problems (Soto, 2015). The idea is for the tool to capture the digital screen as students complete a particular task and verbally describe what they are doing as they complete it (Afflerbach, 2000). I observed Mrs. Burnden, a fourth-grade English language arts teacher, engage her students in screen casting as they composed book reviews about the book *Frindle* using iMovie, another presentation tool. Although the screen casts were not part of the finished product, they did illuminate the processes students followed when drafting and revising their reviews. Furthermore, Mrs. Burnden paired her students and tasked them with watching each other's screen casts and providing constructive comments. These conferences allowed for

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peer feedback and time to make adjustments prior to completing the final version of the iMovie. This is an example of how a digital tool, while not part of the writing process per se, can influence writing instruction.

Digital storytelling apps are another example of this category. Digital storytelling is the practice of composing multimodal texts that share narratives in dynamic ways. They can be personal accounts, professional presentations, or interactive stories and can require students to conceptualize content and apply what they have learned about genre. Digital stories are becoming a staple in many writing classrooms now that the process of integrating audio, video, graphics, and text has become less cumbersome. Most exciting, there are apps for all age levels, enabling even the youngest writers to create dynamic multimodal ensembles.

If you teach young children or are apprehensive about implementing digital storytelling in your classroom, I recommend starting with structured apps. These provide support to the writer by including preset themes, images, and characters. They also take the writer through the process of creating a digital story, teaching students how to combine different modes to compose the narrative. For example, Toontastic 3D, a cartoon-creator app, is organized by genre. The user can choose between a three-part short story, a five-part classic story, or a five-part science report. Audio support leads the writer through the composing process, defining concepts such as conflict, climax, and resolution, and explaining how to navigate through the site. The app provides ready-made characters or the option of drawing your own. Especially exciting, Toontastic 3D allows writers to animate their scenes by moving characters and adding audio dialogue and mood music (see Figure 8.1 for a screenshot).

Once students and teachers become more comfortable with utilizing different modes to tell stories (e.g., audio, video, images), they can transition to less-structured storytelling apps, ones that allow writers to develop their own content and are not confined by the choices provided by the app. The iBook Author app is a powerful example of how authors can compose dynamic multimodal stories. The writer begins by choosing a preset page layout. However, the remainder of the composition is left to the author to determine. You can easily embed interactive graphics, text, video, and 3-D objects. Of particular interest is the ability to insert text saved as a Microsoft Word or Pages document. For instance, I created a new book and inserted this chapter into the app. Quickly, I had a professionally formatted text that could be read on the iPad. Powtoon, VoiceThread, and Tellagami are other apps that fit within this category.

It is critical to add a word of caution about such powerful tools and digital storytelling in general. In order for students to compose effective multimodal ensembles, they must understand that each mode carries meaning (Kress, 2003). They must be aware of audience and consider

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FIGURE 8.1. Screenshot of Toontastic 3D.

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alternative reading paths so that their message is unified and comprehensible (Karchmer-Klein & Shinas, 2012). Similar to issues with PowerPoint, steer students away from the bells and whistles of the tool (Baker, Pearson, & Rozendal, 2010) and toward purposefully selecting modes to develop unified messages.

Presentation apps are more complex to integrate than content apps because they rely completely on teachers' instructional design. If you are hesitant to take this step, it may be beneficial to organize your instruction using Hutchison and Woodward's (2014) Technology Integration Planning Cycle for Literacy and Language Arts. The planning cycle begins the instructional design process by encouraging teachers to identify specific learning objectives. Once these are clear, teachers can make important pedagogical decisions related to the classroom environment such as whether the lesson is teacher or student centered, whether it requires few or more prior experiences, and whether it should be completed individually, in small groups, or as a whole class. Once these goals are established, teachers choose an app that provides support to student learning within the context of the learning goals. Importantly, the planning cycle reminds teachers to deeply consider the appropriateness of the digital tool. If the constraints of the tool are too great to overcome, Hutchison and Woodward recommend instead choosing a nondigital tool to meet the lesson's goals. By following

TABLE 8.2. Noteworthy Presentation Apps

Title	Type
Puppet Pals HD	Digital storytelling tool
Kid in Story Book Maker	Digital storytelling tool
Pictello	Digital storytelling tool
Storyjumper	Digital storytelling tool
Mindmeister	Concept-mapping tool
Popplet	Concept-mapping tool
Baiboard	Collaborative whiteboard
Web Whiteboard	Collaborative whiteboard
Padlet	Collaborative online bulletin board
Write About This	Story prompts
Writing Prompts	Story prompts
SundryNotes Pro	Note-taking tool
Evernote	Note-taking tool
EdPuzzle	Interactive presentation tool
Nearpod	Interactive presentation tool
Voki	Interactive presentation tool

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this process of lesson development, the focus remains on how students can experience, conceptualize, analyze, and apply curriculum content (Cope & Kalantzis, 2015) through meaningful technology-integrated activities rather than using technology for its own sake. See Table 8.2 for a list of noteworthy presentation apps.

Professional Learning Networks

I believe the best way for educators to become well versed in digital tools is by using them regularly in their personal and professional lives. One approach I have embraced in my own practice is building a PLN—digital connections made with educators, parents, university faculty, students, content experts, and other stakeholders. These connections enrich my professional practice by providing space to ask questions, brainstorm, vent, and share resources. The unique aspect of a digital PLN is the opportunity

to connect with the global community, allowing the exchange of truly diverse perspectives.

PLNs can be created using a wide range of tools. My PLN is mostly driven by Twitter (@Rkarchmerklein). In this digital space, I tweet about my courses (@educ777sp17), service to the field (@ILA), and recent publications. I also connect to other educators who I learn from on a daily basis. For example, check out @JenWilliamEDU, an International Literacy Association board member and an educational consultant. Jen tweets regularly, sharing insightful comments on new technologies and best practices with her 45,300 followers. The more I tweet, the more information I find. Sometimes it is an educator's blog, a podcast, or news article.

When you find a resource you like you probably bookmark it on your computer so you can refer to it later. Unfortunately, this approach is limiting because the bookmarks are connected to your computer. So, for example, what do you do if you bookmarked a site on your home computer and you want to access the site on your phone? You may also bookmark sites but neglect to identify the original author or become overzealous and bookmark many more sites than you can ever review. A solution to these problems is digital content curation—utilizing digital tools to strategically select and categorize digital content. I use Diigo to organize my resources, but other educators prefer Feedly, Pinterest, or Evernote.

I recently incorporated a semester-long PLN project into an online course I teach in a Master of Teacher Leadership program at my university. See Table 8.3 for a list of steps.

The course introduced practicing educators to different ways of using technology to foster collaborative experiences with colleagues and a PLN seamlessly fit within the learning objectives. In an effort to make the activity applicable to everyone, I asked students to identify a problem of practice (POP) found in their professional environment that they were invested in examining closer (City, 2011). Each week they built another aspect of the PLN related to the POP. They began by identifying and connecting with professional organizations that published content about their POP. The following week they focused on finding educators who were interested in the same POP and discussed the topic on social media platforms, such as Twitter chats or blogs. They connected with them using digital tools such as LinkedIn and Plus.google.com. The third week students connected with people they knew personally, both in and outside of their professional settings. The final step of the project required students to take a step back and carefully examine the information they uncovered about their POP through their PLN. This was a critical portion of the project because students evaluated the content to determine whether their PLN contacts were reliable sources. For this course, I utilized the five criteria outlined in the CRAAP

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TABLE 8.3. Steps to Developing a PLN

Steps	Description	Example(s)
Problem of practice (POP)	Identify a POP found in your professional environment that you are invested in examining closer.	In my fifth-grade class, at least five students have difficulty writing complex sentences.
Professional organizations	Identify and connect with professional organizations whose mission statements and resources relate to your POP.	National Council of Teachers of English National Writing Project International Literacy Association
Educators	Identify and connect with educators who examine issues related to your POP.	A Year of Reading (blog) @2TLmshine (Twitter) @laffinteach (Twitter)
Colleagues	Connect with people you have established relationships with and discuss your POP.	
Evaluate	Closely examine the information gathered from your PLN using the CRAAP test.	

test designed by the Meriam Library at California State University, Chico (2010):

1. Currency: timeliness of the information.
2. Relevance: importance of the information as it relates to the POP.
3. Authority: quality of the source of the information.
4. Accuracy: reliability and correctness of the information.
5. Purpose: reason the information is published by the author.

Creating a PLN is beneficial because it allows on-demand professional development tailored to meet the needs of the individual teacher. I encourage all educators to take the leap to envelope themselves in digital tools, learning with and about them along the way.

Final Thoughts

Teachers are more inclined to integrate digital tools when there is a clear connection between technology-based activities and curriculum standards

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(Karchmer-Klein, 2007). Fortunately, technology is embedded within the CCSS (NGA & CCSSO, 2010) for writing. When I was asked to write this chapter, I took a closer look at the Standards and found that while the degree and complexity to which technology is included at each grade level varied, there were four common threads. Students are expected to (1) use a variety of digital tools, (2) produce and publish digital text, (3) interact and collaborate with others on their writing, and (4) use multimedia (i.e., modes) to scaffold comprehension of their texts. The applications and examples presented in this chapter illustrate how students can use digital tools for these purposes.

In conclusion, digital tools and the ease of publication have expanded students' opportunities to communicate their voices. As such, audience awareness has become even more critical. Rather than blame technology for poor writing skills, I encourage educators to examine its affordances and constraints and most importantly, expand their repertoire of writing instructional practices to teach students when and how to craft their work for appropriate settings. We must bridge in and outside of school writing opportunities or we disservice our students by privileging written language while reality takes place in a multimodal world. I hope the tools and examples discussed in this chapter empower educators to try them out and further explore best practices.

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