

Chapter 3

Learning and Leading for Transformative Technology Integration



Learning Outcomes

After reading this chapter and completing the learning activities, you should be able to:

- 3.1 Identify the mindsets of teacher leaders that contribute to their ability to identify problems and create solutions. (ISTE Standards for Educators: 1—Learner; 2—Leader; 4—Collaborator)
- 3.2 Describe connected educators, connected learning communities, and the technological resources that support teacher engagement in connected learning activities. (ISTE Standards for Educators: 1—Learner; 2—Leader; 3—Citizen; 4—Collaborator)
- 3.3 Recognize strategies to build a compelling and consistent online professional identity. (ISTE Standards for Educators: 1—Learner; 2—Leader; 3—Citizen; 4—Collaborator)
- 3.4 Generate a personal rationale for using technology in teaching based on history, educational standards, contextual conditions, emergent trends, learning theory, and research findings. (ISTE Standards for Educators: 1—Learner; 2—Leader)

Technology Integration In Action: Teacher Leadership Makes It!

GRADE LEVEL: Middle School

CONTENT AREA/TOPIC: English language arts

LENGTH OF TIME: 4 weeks

PHASE 1 Analysis of Learning and Teaching Assets and Needs

Step 1: Analyze problems of practice (POPs)

Ms. Alkhouri had been teaching English language arts (ELA) at Honnely Middle School for nearly 6 years. Honnely Middle School is in an urban area and serves a diverse student body: 60% African-American, 20% Latino/a, 15% Caucasian,

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and 5% Asian; 60% are eligible for free/reduced lunch; 30% are English Learners; and 30% are receiving special education services. In the last few years, most of the students in Ms. Alkhouri's 7th grade ELA class were just passing the state test for writing and reading. She struggled to engage many of the students in language arts, especially writing. She knew there was much room to grow in both her instruction and her students' learning.

Step 2: Assess technological resources of students, families, teachers, and the school

The school had good Internet connectivity and a few computer labs, and each classroom had about four chromebooks. Sometimes one classroom would share them with another class. Ms. Alkhouri was growing somewhat impatient as the years passed because the increases in technological access were modest but not enough to really make a difference in her teaching and students' learning.

In past years, the district had purchased a learning system that allowed her students to work on reading comprehension. She was able to take the English classes to the lab about once a month, but every week she also used a **rotation model** with the chromebooks as one station in which students worked on the reading comprehension software.

In a recent districtwide professional development day, she had talked with some of the ELA teachers in other district schools who had expressed a similar frustration with the limited technology access at their schools and the desire to move beyond the one learning system. One of those teachers, Ms. Read, had noted that a gifted and talented class in her school had been borrowing chromebooks from other teachers to facilitate the creation of blogs. This situation reminded Ms. Alkhouri of research she had read about. The research showed a pattern of digital inequity for students of color, lower socioeconomic status, and/or lower achievement in using technologies (if at all) for lower order cognitive activities such as drill and practice while students of more affluent means and higher achievement have opportunities to use technologies for creation, collaboration, and communication activities.

Ms. Alkhouri had read the ELA standards and was familiar with the International Society for Technology in Education (ISTE) Standards for Students as well. She felt that her students were mainly developing text-based literacy, rather than **digital literacy**. For example, the students received knowledge through the reading comprehension program but were not learning to express themselves across aural, linguistic, spatial, and visual means with different media such as video, audio, and graphics. They needed these communication skills now and for the future. The software for reading comprehension seemed like it might be helping the students a little, but she honestly wasn't able to use it as often as she was supposed to because of the technological access difficulty. But even if she were able to, she wasn't sure the students would maintain engagement with it; it wasn't a digital technology they really sought. Outside of class, many of these students were playing lots of games; some played console, handheld, or web-based games. Recently, *Minecraft* and *Sims* had become quite popular among them. She knew some students had weekend game nights together. Other students had begun to use social networking apps as well. Then there were a few students who had very little access to technology at home, primarily via a parent's mobile phone. She felt responsible for developing those students' technological access and experiences as well.

Step 3: Identify technological possibilities

Ms. Alkhouri set her mind to thinking about this challenge. She blogged about the issue and shared it with fellow teachers on Twitter #elachat and received many ideas to add to her class activities. She began to work with Ms. Read to learn more about the gifted and talented blog activity with students at her school. What if they could engage their students in creative writing over a period of time with the ultimate goal of publishing a favorite piece in a digital magazine they'd create together and host on the district website? Each student would have an independent blog, but it would be on the district network only, so all the students in the two teachers' classes but not the general public (yet!) could see others' work. As their first project using blog technologies, the teachers wanted to encourage success, and part of that would be teaching the digital citizenship skills that go along with using web-based technologies within a safe, trusting closed space for now. The challenge was they did not have access to software for book or magazine layout and design.

Then Ms. Alkhouri was invited to a Saturday **Edcamp** conference at a high school nearby. She invited Ms. Read to attend with her. Besides meeting many fabulous local educators, she learned about a new idea—**making**. It intrigued her. The idea is that students use their own creativity to make shareable products such as sewing projects, cardboard cities, programmed robots, books, and digital games. She immediately started following #makered on Twitter and was intrigued that not many English teachers were using the making concept to engage students in writing and reading, but her magazine idea fit right in. Then she found #makewriting, another hashtag with more ideas. She saw an approach to inspiring poetry by having students build Jenga poetry using wood blocks that have permanent words on them. The students assemble blocks together to make a poem. Another teacher had students represent important settings of stories they read by creating physical layouts, such as a courtroom, in cardboard with the option to use programmable elements, such as littlebits—modular electronics that snap together with small magnets for prototyping and learning—to add interactivity such as flashing lights. She also was interested in print and digital bookmaking, something she thought the students would really like.

The project's challenge mainly involved resources. Ms. Alkhouri's principal, now more aware of digital inequities that might be occurring in the school and district, was supportive of her and Ms. Read's ideas. Ms. Alkhouri had already been in touch with the school librarian to discuss making; she had heard of it because librarians are often involved in developing or managing makerspaces in K–12 schools. The librarian told her about a TeacherPreneur grant he had recently heard about. It could be the key to obtaining resources.

Ms. Alkhouri knew that she wanted a **makerspace** that could support literary arts, such as bookmaking, and visual and oral expressions, such as making films, podcasts, and vodcasts. This was getting big and exciting! But how could they serve the students in both Ms. Read's and Ms. Alkhouri's classrooms when they were at different schools?

Ms. Alkhouri decided to apply for the TeacherPreneur grant. She sketched out the main ideas of the project: The grant could support mobile maker carts that could be shared across the urban-area middle schools in the district. She scoured her Twitter network and the blogs she followed for information and was interested in the following two carts:

- The storybook-making cart, including digital storytelling tools (e.g., Voki, PowToon, Storybird), book making tools such as iBooks Author and BookCreator, and digital fabrication tools such as paper cutters and design software.
- The media production-making cart, including tools for creating films, podcasts, vodcasts, stop-motion animation, screencasting, and web development.

Each cart would be a rolling storage trunk and could be wheeled into a district van. To move forward on the grant, her principal wanted to hear more about how this would be used, so they planned the creative writing project.

PHASE 2 Design of the Integration Framework

Step 4: Decide on learning objectives and assessments

Ms. Alkhouri and Ms. Read decide to focus a unit on creative writing and poetry, specifically helping students create found poems. Students would first learn to create found poems based on focal text and later build them based on experiences, environments, or contexts that inspire them. These latter poems would be expressed in multiple media formats, such as graphically, visually, or aurally.

The outcomes, objectives, and assessments they developed were as follows:

Outcome: Students will use five different writing process elements (planning, drafting, revising, editing, and publishing).

- **Objective:** 100% of students will engage in the five elements of writing process as they create poems.
- **Assessment:** Use an observational rubric to assess participation in elements of process writing.

Outcome: Students will gather data from a variety of sources (e.g., print and nonprint texts, artifacts, people) to create and communicate original ideas.

- **Objective:** 100% of students will create an original print and nonprint found poem.
- **Assessment:** Use a checklist of submitted poetry and a rubric to assess the types of artifacts included in found poems (e.g., text, pictures, video, audio).

Outcome: Students will use a variety of technological resources to create and communicate.

- **Objective:** 100% of students will use a digital technology tool appropriate to their poetry creation needs.
- **Assessment:** Use a technology use log.

Step 5: Design integration strategies and determine relative advantage

Ms. Alkhouri and Ms. Read designed the following sequence of activities for the 4-week project:

Days 1 and 2: The teacher will read a high-interest, action-filled print text. As the students listen, the students will write down words or phrases they like from the text. Students will write the words/phrases on the whiteboard, and the teacher will model writing a found poem from the word array. Students will work in dyads to begin writing their own found poems. The second day, the teacher will model a revision after the class provides feedback and asks questions. Then the dyads will revise their poems.

Days 3–5: The teacher will model creating a found poem from a nonprint "text," such as a local theater production she attended. While attending the play, the teacher had taken pictures, written down words and phrases, and recorded sounds that she had heard. In class, the teacher will show the array of print and nonprint artifacts and models the process of building a multimodal poem from these artifacts. Using VoiceThread, the teacher will build the nonprint poem. Students will provide feedback, and the teacher will do more revising. Students will brainstorm high-interest experiences from which they would like to build nonprint found poems such as playing or attending

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sports games, playing video games, hiking, swimming, and going to the beach. Students will check out from the school various media production tools such as voice recorders, video cameras, and digital cameras to collect their artifacts.

Week 2: Students will read two additional print texts and write two found poems based on the texts. They will add them to the class blog. The class will provide feedback on two students' poems, and then the students will revise poems based on feedback from the teacher and their peers. Throughout the week, students will continue using media production–recording tools to capture artifacts to produce a nonprint found poem.

Week 3: With support of the librarian and media specialist, students will work individually to produce their nonprint found poem. They will be able to choose the medium (visual, aural, tactile) and appropriate digital technology tools, such as Prezi, VoiceThread, PowerPoint, audio editing, video editing, and so on to help build their found nonprint poetry.

Week 4: Students will present their nonprint poetry to the class with time for student and teacher feedback. Students will engage in revision and then publish the poems to a web page on the school's website.

Relative Advantage

With the creative digital writing project planned, Ms. Alkhouri and Ms. Read determined the relative advantage by RATifying the new unit. Figure 3.1 shows the aspects of instruction, student learning, and curriculum that they felt would be impacted by the found poetry project. They could see the transformative potential of this project, and they felt there was relative advantage.

Ms. Alkhouri presented the plan and the RATification to her principal, librarian, and media specialist. They could really see how this experience was fundamentally different than the past technological experiences of these students.

Step 6: Prepare the instructional environment and implement the lesson

Ms. Alkhouri had the support at her school but with Ms. Read's participation in the planning, they wanted the idea to benefit as many children in their middle schools as possible. They set up meetings at each of the schools to introduce the idea to see whether there was adequate support from the principals, time for the librarians who would facilitate and house the carts, and teachers' interest in using the making carts in their curricula for students' learning. They had overwhelming response from many teachers, and the other principals indicated that if the grant was not approved, Ms. Alkhouri should try to fund it in another creative way. However, she submitted the grant and later received an email that read: "Dear Ms. Alkhouri, We are pleased to inform you that your grant proposal, Mobile Making Carts, was accepted for funding this year . . ." The librarians were keen on the project as well even though it introduced more work for them. Each examined physical spaces and found ways to create an area for permanent materials, such as docking and charging stations, accessories, and support tools. The librarians also needed to locate a space for the mobile maker cart during its stay at the school.

The carts were created, and Ms. Alkhouri was ready to inaugurate the first maker-supported lesson. She completed the following tasks to prepare:

- **Selected stories and gathered artifacts**—She chose a high-interest, high-action book and gathered data from a community event, an art opening for the artist Ai Weiwei, for the first week's activities.
- **Scheduled library**—Ms. Alkhouri needed the library for a 2-day period for students to select books for the second week's activities.

Figure 3.1 Ms. Alkhouri's and Ms. Read's RATified Lesson

	Instruction	Learning	Curriculum
Replacement Technology is a different means to same end.			
Amplification Technology increases or intensifies efficiency, productivity, access, capabilities, etc., but the tasks stay fundamentally the same.	<ul style="list-style-type: none"> • Blog entries and updates reveal writing process steps 	<ul style="list-style-type: none"> • Various digital production tools facilitate multimodal poetry creation 	
Transformation Technology redefines, restructures, reorganizes, changes, and creates novel solutions.	<ul style="list-style-type: none"> • Teacher models through creation on VoiceThread • Multimodal artifacts for poems inspired by students' own experiences 	<ul style="list-style-type: none"> • Students publish poetry to audiences outside the school via school website • Students engage in peer feedback on blog • Students create multimodal poems 	<ul style="list-style-type: none"> • Engages students in new literacies—creating multimodal poems

- **Created blog and website**—She worked with the media specialist to create the classroom blog where students would post their final poems and receive feedback from peers and the web page on the school's site where the final nonprint found poems would be published.
- **Scheduled media specialist**—The media specialist was planning to assist throughout the third and fourth weeks. She had already been orienting the students to many of the media production and storytelling tools, but she knew they'd need hands-on assistance.
- **Prepared assessments**—Ms. Alkhouri created the rubrics and checklists.

PHASE 3 Post-Instruction Analysis and Revisions

Step 7: Analyze lesson results and impact

Although tentative at the beginning of the first lesson on found poetry, the students became extremely engaged in creating their nonprint found poems. Reviewing the rubrics and checklists, Ms. Alkhouri found that nearly all students had engaged in the full writing process but that a few students had not edited their work prior to publishing. The students had used an appropriate technological tool; most had used multiple tools to create their poem. The media specialist revealed that the poetry web page had the most hits on the entire district website for several weeks.

Step 8: Make revisions based on results

The area with the biggest improvement was technical support for students' poetry creations. It was not surprising that the students were unfamiliar with many of the resources in the maker carts because they had not done hands-on technology activities prior to this project. The media specialist was creating help guides and videos on web pages to support individual just-in-time learning and was changing the computer class curriculum to move from teaching only word processing and presentation to focus on activities that the maker tools could support.

Step 9: Share lessons, revisions, and outcomes with other peer teachers

Ms. Alkhouri tweeted links to the poems on #makered and #elachat. Ms. Read was beginning the same found poetry unit at her school. She and Ms. Read began developing the teacher professional learning resources that the grant also supported, including a series of webinars that highlight the possibilities for each maker cart (made with the media production-making cart!), a districtwide professional learning community (PLN) focused on making in content areas built on the district's Edmodo site, and 3 days of onsite, professional making experiences for teachers spread across the first year.

Based on Hundley, J. (2004). Uncovering truths beneath a found poem. *The Quarterly*, 26(3). Retrieved from <https://www.nwp.org/cs/public/print/resource/1981>; Johnson, M., Witte, B., Randolph, J., Smith, R., & Cragwall, K. (2016). Have maker cart, will travel. *School Library Journal*, 62(6), 20–20; and Schulze, P. (n.d.). Found poems/parallel poems [Lesson Plan]. Retrieved from <http://www.readwritethink.org/classroom-resources/lesson-plans/found-poems-parallel-poems-33.html>

Introduction

This book and its supporting activities are intended to help you advance as a teacher who integrates technology to transform teaching and learning for the students in your classroom. To make the teaching profession stronger and create even more possibilities for student learning, teachers can lead and collaborate to create positive, strategic, and critical changes within education. This chapter introduces the concept of teacher leadership and situates it within the field of educational technology. The chapter begins by describing productive mindsets of teacher leaders who work toward educational innovation. Then it explains how teachers can learn and lead as connected educators who build an online teacher identity and positive reputation and establish a personal, sound rationale for educational technology.

Teacher Leadership

Teacher leaders are teachers who possess K–12 teaching responsibilities with students but who also engage in leadership activities outside their classroom (Wenner & Campbell, 2017). The fact that teacher leaders continue teaching students and maintain a peer relationship with other teachers is significant to their work as leaders because teachers are more likely to adopt new innovations when recommended by

peers (Rogers, 2003). Some of the leadership activities outside the classroom involve (a) supporting other teachers' professional learning, (b) engaging in activity in policy decision making, (c) improving student learning, and (d) and seeking whole-school improvement (Wenner & Campbell, 2017). In a recent literature review, these authors reported that teacher leadership activities tended to be situated within the school in which the teacher teaches, but many other examples extend the leadership impact to the wider teaching and learning profession (e.g., Cuthbertson, 2010; O'Neil, 2016; Zeichner, 2011).

From our perspective, **teacher leadership** involves teachers engaging in leadership activities that enable the pursuit of important educational challenges, especially the needs of our nation's diverse students and families (which corresponds with **turn-around pedagogy**)—challenges identified *by* teachers, not assigned *to* teachers. Gabbard's (2016) definition of leadership emphasizes that a teacher with such leadership capacity must possess a degree of freedom or agency to identify pressing issues and the authority to respond to them, such as creating ideas, solutions, or doing something that inspires others to become involved and leads to change that potentially transforms students' lives. Teacher leadership, from our perspective, does not involve teachers engaging in leadership activities assigned *to* them. Instead, leadership is inspired from within the teacher to challenge the status quo, to uphold fair and equitable educational opportunities for all children, and to act for and on their behalf.

A teacher leader has also been referred to as a **teacherpreneur** (Berry, 2015a, 2015b; Berry, Byrd, & Wieder, 2013). The term *teacherpreneur* merges the innovative *teacher* with activities and characteristics associated with an *entrepreneur* (Wolpert-Gawron, 2015), an individual who organizes, manages, and assumes the risks of a business. Teacherpreneurs' work in their classrooms is creative and meaningful to themselves and their students, but their professional activity extends beyond their individual classroom to find and solve larger problems or challenges innovatively. For example, teacherpreneur Shannon C'de Baca, an online science teacher in Iowa, is an online mentor to preservice teachers in Asia (Berry and TeacherSolutions 2030 Team, 2010). Another teacherpreneur, Jennifer Barnett, is a teacher with expertise in digital technologies and project-based learning who moved to teach in a rural high school where she began contributing to a school and districtwide instructional innovation toward project-driven instruction. The high school where she teaches ultimately won an award for serving all its students. Teacher leadership is enabled by three crucial mindsets: creativity, agency, and community.

Creativity

Creativity and creative processes are important to the work of teacher leaders (Gabbard, 2016). According to Amabile (2013), creative work requires the following personal and institutional characteristics:

- **Cognition**—Flexible thinker with the ability to move beyond prescriptions
- **Personality**—Self-discipline and openness to ambiguity
- **Domain specificity**—Expertise in a knowledge domain (e.g., teaching, technology)
- **Intrinsic motivation**—Inspiration from within the self to engage in work

Video Example 3.1 Growing Teachers as Leaders

In this video, staff from Vancouver Public Schools describe how teachers have become leaders who act on a strategic vision. The superintendent explains that trust is empowerment and permission to take risks that lead to innovation and iteration.

<https://youtu.be/gozQhf7kayI>

- **Socialability**—Involvement in a work environment that affords team work, freedom to carry out work, support for new ideas, vision for creativity in the larger social environment, and active sharing of ideas.

Ultimately, the creative process combines these characteristics to encourage teacher leaders to work independently and collaboratively, take risks, and gain and share fresh perspectives on problems. Creativity is enabled through agency and community.

Agency

Key to the work of teacher leaders is agency, which is the permission to act purposefully and constructively and to identify salient problems in need of attention (Calvert, 2016; Gabbard, 2016). Receiving some level of autonomy from school administration and taking risks without fear of penalties were found to facilitate teacher leadership (Wenner & Campbell, 2017) and engagement in professional learning (Calvert, 2016). Hargreaves and Fullan (2012) established that teachers need agency for learning and collaborating. Berry and TeacherSolutions 2030 Team (2010) discussed the importance of teachers feeling ownership of their profession through leadership work. For example, teachers demonstrate agency when they can plan and present professional learning topics to other teachers, engage in learning communities with colleagues whom they trust, look for expertise in themselves to solve problems, or identify their own practical, professional learning needs.

Community

Teachers' and leaders' work is context specific, and the community in which they work can be supportive or serve as a barrier. When teacher leaders are provided time, space, and support from administration and have good relationships with other teachers, leaders are free to collaborate and facilitate creative learning opportunities toward a shared vision (Calvert, 2016; Wenner & Campbell, 2017). When working in school communities in this way, teacher leaders can enact Amabile's (2013) creative processes. Depending on the target of a teacher leader's work, the community context can range from the school in which the teacher works to district or statewide groups and to global communities enabled through the Internet. Fullan (2016) notes the importance of connecting and engaging with others in the world to share and explore ideas.

Benefits and Challenges of Engaging in Teacher Leadership

Teacher leaders who are ready, willing, and able to take on these challenges provide a service that ultimately benefits students but also the teaching profession. Wenner and Campbell (2017) found the following benefits as a result of teacher leadership activities:

- Better working relationships among all colleagues
- Feelings of confidence and empowerment in the teacher leader
- Growth as a professional for the teacher leader
- Expansion into other leadership activities for the teacher leader
- Growth in professionalism across all teachers in school

However, their review also found the following challenges:

- Increased stress mostly because of the difficulty in balancing the responsibilities of both teacher and leader roles
- Lack of time, which impacted balancing family with work and balancing support for students with peer faculty

Technology Integration

Example 3.1

TITLE: Video-Based Lesson Study

CONTENT AREA/TOPIC: English language arts

GRADE LEVELS: K–2

ISTE STANDARDS FOR EDUCATORS: Standard 1—Learner; Standard 4—Collaborator

IRA/NCTE: Standard 4

DESCRIPTION: A group of K–2 teachers needed to learn more about using guided reading practices with their students to develop early literacy. The group thought that guided reading could help provide differentiated support for meeting the needs of all of the students, who had a range of reading abilities. The second grade teacher, Lorena, was more familiar with guided reading practice and suggested that the group start a video-based lesson study group. In lesson study, the teachers conduct cycles of identifying learning challenges, planning lessons to tackle them, observing and discussing the lesson and analyzing students' work on it, revising the lesson, and reteaching it. Lorena adapted the lesson study process to use video-based observations, which allowed all the teachers to virtually observe, analyze, and provide feedback about the lessons. The school had an account with FlipGrid, and the teachers decided to use it to support their video-based lesson study. After working for a year to hone their guided reading practices, Lorena and the other teachers began a second phase in which they started to examine how educational technologies might extend their work with guided reading. Sam, the first grade teacher, wanted to examine how the use of video self-monitoring techniques—by which students would film themselves reading a page of text with fluency—might support their development. The video would also be added to each student's SeeSaw portfolio that is accessible by the student, parents or guardians, and even next year's teacher.

Based on ideas in Bates, C. C., Huber, R., & McClure, E. (2016). Stay connected: Using technology to enhance professional learning communities. *The Reading Teacher*, 70(1), 99–102. <https://doi.org/10.1002/trtr.1469>

- Feelings of “being dumped on” or having inequitable tasks
- Collegial relationships suffering because peer teachers perceive the teacher leader to have more power than they do
- Resistant colleagues

Some teacher leaders involve themselves within leadership activities related to technology and technology integration. Teacher technology leaders like Ms. Alkhouri in the opening scenario use their keen knowledge of students to identify pressing challenges and propose ways that technology might be able to transform learning experiences and meet students' needs. The Technology Integration Example 3.1 illustrates how a teacher leader supported colleagues in using a video-based lesson study to examine guided reading practices.



Check Your Understanding 3.1

The Connected Educator

Teacher leaders, who have agency and autonomy to identify and pursue important educational challenges, and classroom teachers must engage in learning processes to develop creative solutions to important problems. Professional *development* has been criticized as something teachers receive from others at certain times or days whereas professional *learning* involves teachers as agents involved in their own learning and who have input on topics, forms, and activities of learning (Calvert, 2016; Stevenson,

Hedberg, & O'Sullivan, 2015). New web-based technologies, which will be fully described in Chapters 6, 7, and 8, are changing the nature of professional learning by enabling meaningful collaboration and authentic collegiality through online relationship building (Nussbaum-Beach & Hall, 2012; Stevenson et al., 2015). There is also an advantage to using web-based technologies—the same technologies that we use to help students learn with in the classroom—in professional learning because doing so models web-based learning at the adult learning level that teachers can adopt for K–12 learning (Ertmer & Ottenbreit-Leftwich et al., 2012). Learning with others online is referred to as **connected learning**. When teachers engage in connected learning, they become **connected educators**. Fishman and Dede (2016) argue that the historical isolation of teachers is no longer sustainable and teachers must network connections among students, parents, teachers, and global contacts along with expansive resources. Although teacher leaders can lead without using digital technologies, they can learn much more by being connected educators. Thus, this section describes the ways teachers are becoming connected educators through communities that offer teachers more control of their learning.

Connected Learning Communities

Connected educators learn through **connected learning communities** (Nussbaum-Beach & Hall, 2012), which combine the benefits of four offline and online sources for professional learning.

1. **Conferences and meetings**—Teachers access free, short events such as Edcamps and meetups that are often advertised through social media. Edcamps use a format that positions voluntary attendees to self-organize, collaborate, and identify the content and learning needs and teach sessions through participation. Some virtual Edcamps have also been held using collaborative technologies such as GoogleDocs, Twitter, or **videoconferencing**. Furthermore, participant-identified sessions often focus on technology (Carpenter & Krutka, 2014; Wake & Mills, 2014). In a study of 22 Edcamps, Carpenter and Linton (2016) found that participants highly valued collaboration and discussion, the autonomy and participant-driven format, and the networking opportunities. Another event is a **meetup**, an interest-based group that meets physically across the globe. The Meetup website offers social technologies to organize meetups. No academic research has been conducted on the value of meetups, but Allen (2016) suggests meetups can reduce teacher isolation.
2. **Professional learning communities (PLCs)**—Teachers learn in these school-based, typically face-to-face groups that include teachers, administrators, and sometimes students and parents committed to continuous school improvement efforts. PLC activities can be grade level, department level, or schoolwide and typically focus on improvement goals that optimally, although not always, include teacher input. Some PLCs have used videoconferencing to expand membership and offer increased flexibility, which participants felt was effective when facing needs to overcome distance and time barriers (McConnell, Parker, Eberhardt, Koehler, & Lundeberg, 2013).

Video Example 3.2 Learning through Edcamps

In this video, learn about the Kettle Moraine School District's planning, organization, and success in offering an Edcamp as a form of professional learning for their own and other districts' teachers.

<https://youtu.be/qfN37c1oOkY>

Video Example 3.3 The Learning Team

In this video, Samone Graham, a high school biology teacher, describes how fellow teachers and her students compose a crucial “learning team” in her school’s focus to improve teaching with technology.



3. **Personal learning network (PLN)**—**Personal learning networks (PLNs)** are professionally based networks designed personally by the educator to assist with professional learning and growth. Educators use PLNs to pursue self-identified goals or learning needs and to share their own knowledge. The network consists both of face-to-face connections, such as meetings in a local area and conferences, and online connections. For example, a teacher who follows particular educators on Twitter is beginning to form a PLN.
4. **Communities of practice (COP)**—**Communities of practice (COP)** are special interest groups that are **distributed knowledge networks** for practitioners. COP members share an interest area, practice or purpose, and collective expertise (Wenger, 1999). The ISTE conference is a face-to-face COP, but the Classroom 2.0 Ning website is an online COP. Outcomes from COP activity are co-created knowledge in which the sum of knowledge has more value than that of the individual components.

In connected learning communities, the social element that is crucial to creativity is expanded to include the global society through networked technologies.

Technological Resources and Strategies for Connected Learning

There are ever-expanding web-based technology resources that assist in the connected learning community’s efforts to support professional learning, such as socially connecting and collaborating with other professionals and documenting, archiving, and creating information (Booth, 2012; Nussbaum-Beach & Hall, 2012; Trust, 2012). Many of the following web-based technologies can support multiple activities, such as social connecting people and archiving information:

- **Email**
- **Microblogs**, such as Twitter
- Facebook, LinkedIn, Google + Pinterest
- **Social networking sites**, such as Edmodo or Ning
- YouTube, TeacherTube, Teaching Channel

- **Blogs**
- **Wikis**
- **Podcasts**
- Skype
- Discussion forums
- GoogleDocs
- GoogleReader
- **Curation tools**

The examples illustrating the following categories should be considered flexible because they can fit into multiple categories.

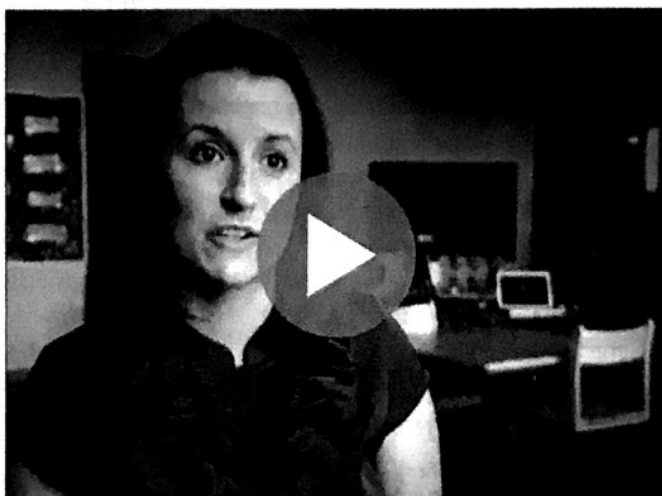
CREATING SOCIAL CONNECTIONS FOR COLLABORATION Collaboration involves individuals connecting to construct knowledge together. Personal knowledge building helps individuals contribute new ideas to others. Collaboration involves educators trustfully giving and taking knowledge for various purposes (Whitaker, Zoul, & Casas, 2015). A prerequisite step of collaborating is connecting with other people (Trust, 2012). **Web 2.0** technologies, such as blogs, microblogs, and social networking sites (SNSs), allow users to create an identity and connect with other users by following or adding them to a user's network. For example, use of Twitter, a microblogging service, is rising among teachers (Carpenter, 2015; Visser, Evering, & Barrett, 2014). Preservice teachers who used Twitter indicated that it supported connecting, communicating, and resource sharing with educators (Carpenter, 2015).

Once connected, teachers can collaborate in various ways (Booth, 2012; Rodesiler, 2015; Trust, 2012) including:

- Providing support
- Receiving feedback and support
- Sharing information and resources
- Finding resources, ideas

Video Example 3.4 Following Blogs

In this video, Tara Gander, a technology facilitator, explains how she follows blogs to keep her learning fresh.



Rodesiler (2015) examined the nature of English teachers' online professional learning activities and found that the teachers prominently supported and sought support from other teachers. For example, teachers provided classroom-based models, such as tweeting a picture of the teacher's classroom library and student work samples or posting a YouTube video of a student writing celebration (note that student-related information should be shared only if it is unidentifiable or parent permission has been given). Teachers also asked for support from online colleagues, such as posting a blog seeking book suggestions for specific genres or tweeting a request for music related to the American Dream theme. Some teachers follow popular educational thinkers, such as educators who are often keynote speakers at conferences, through social networks to get ideas and influence their perspectives on education (Stevenson et al., 2015).

As reported by Ostashewski, Reid, & Moisey, 2011, teachers joined an online social networking community to learn about teaching robotics in the classroom. The SNS provided teacher flexibility and control, promoted network development, and increased technology experience. To collaborate, teachers used many built-in features in the online social networking community, such as user-created groups and forums, personal and group blogs, calendars, content sharing, and messages. Research indicated that the flexibility for learning was of greatest value along with the content and SNS experience. Teachers are joining existing networked communities, such as Classroom 2.0 and The Educator's PLN, both on the Ning platform, and edWeb.net (Trust, 2012). Sustaining knowledge, sharing activities, and trust among educators within online communities were found to be significant challenges, and successful online communities have established (a) clear identity or purpose, (b) multiple ways to participate, (c) inclusion of a moderator, and (d) modeling of appropriate or expected online behavior (Booth, 2012). The Technology Integration Example highlights a student teacher who is developing as a connected educator.

Technology Integration

Example 3.2

TITLE: Virtual Induction

CONTENT AREA/TOPIC: Mathematics

GRADE LEVELS: 9th–12th grades

ISTE STANDARDS FOR EDUCATORS: Standard 1—Learner; Standard 4—Collaborator

NCTM: The Teaching Principle

DESCRIPTION: Alexa, a student teacher, begins to develop an online professional network to support her professional learning as she transitions from student teacher to novice teacher, a timeframe referred to as induction. Alexa anticipates that mentors with expertise in mathematics or mathematics education might assist her in becoming a better teacher. In the last semester of her preservice preparation when she is student teaching, she begins using Twitter in earnest to make connections with educators, amassing at least 30 math-related connections. She begins connecting and collaborating with these online colleagues by requesting information, sharing news and resources, showing appreciation, and responding to those who tweet her. Her use of Twitter continues after certification, during job hunting for a teaching position, and through her first year of teaching. A subgroup of mentors including three secondary mathematics teachers, a secondary-level science teacher, and a university-based educator, engage with her most often. As a novice teacher, Alexa recognizes that the mentors are helpful in different ways. For example, one math teacher provides resources and lessons that help students learn difficult mathematics concepts. Another mentor is the one she goes to for best practices in using educational technologies in the classroom. The science educator reminds her to consider ways she could collaborate with other subject areas.

Based on ideas in Visser, R. D., Evinger, L. C., & Barrett, D. E. (2014). #TwitterforTeachers: The Implications of Twitter as a self-directed professional development tool for K–12 teachers. *Journal of Research on Technology in Education*, 46(4), 396–413. <https://doi.org/10.1080/15391523.2014.925694>.

Video Example 3.5 Future Ready: Becoming a Connected Educator

In this video, Diane Lauer of the St. Vrain Valley School district describes how they support teachers becoming connected educators in their district, including the use of PLNs, PLCs, and COPs.

<https://youtu.be/Z5D3pXKefUA>

CREATING, DOCUMENTING, CURATING, AND ARCHIVING INFORMATION

Connected educators also create new content and curate and archive information (Nussbaum-Beach & Hall, 2012; Rodesiler, 2015). For example, Cindy, a sixth grade English teacher, used a blog to co-facilitate collection and redistribution of content written from several educators interested in the topic of reading (Rodesiler, 2015). Teachers used Twitter to redistribute links that connected to articles, websites, blogs, and videos using the **hashtag** #engchat. Teachers wrote original content, posted it on a professional blog, and then promoted its consumption by others by tweeting links to it. Such shared content often led to uptake, discussion, and problem-solving with others.

To support early career teachers' professional learning, Kim, Miller, Herbert, Pedersen, and Loving (2012) described how they used wiki technology to collect and share lesson plans and resources and collaborate on a group project. VoiceThread, a voice annotation tool, similarly allows teachers to collect and share student work samples among teachers and facilitates reflection and analysis within a professional learning community (Bates, Huber, & McClure, 2016). For example, an elementary teacher initially posts a work sample and then voice annotates the sample to provide context and identify issues for discussion. In return, her colleagues review it and add comments, suggestions, or even provide other samples.

STRATEGIES FOR DEVELOPING AS A CONNECTED EDUCATOR Several strategies for developing as a connected educator include those from Whitaker et al. (2015):

- Invest time in developing your professional network
- Schedule time to network and take time off from networking
- Promote other people
- Respond to connected people in your network
- Assume and offer trust
- Build relationships
- Model connected learning

Benefits and Challenges of Being Connected Educators

BENEFITS According to researchers (e.g., Booth, 2012; Carpenter, 2015; Ertmer et al., 2012; Marin-Diaz, 2014; Sie et al., 2013; Visser et al., 2014), connected educators working within connected learning communities have reported overwhelmingly positive benefits including:

- Motivation to learn and engage in the education profession
- Access to different perspectives and inspiration
- Autonomy and agency (self-direction) for what they want to learn, when they want to learn, and how they want to learn

Video Example 3.6 Collaborating with Other Teachers Online

In this video, Chris Gammon, a seventh grade social studies teacher, describes how he and his colleagues benefit from accessing online learning communities for connected learning.



- Increased innovation
- Increased status and reputation
- Feedback on ideas
- Engagement with intelligent, insightful people
- Individualized, personalized learning
- Flexible scheduling
- Access to meaningful relationships, knowledge, attitudes, and values

CHALLENGES Carpenter (2015) and McLean et al. (2014) found that the challenges of being a connected educator focused primarily on reliance on Internet access and the already high workload as a teacher, which leaves little time in the day for more.



Check Your Understanding 3.2

Online Teacher Identity

When teachers sign up and use various online social media resources, they develop a **digital footprint**. As teachers become connected educators, they must consider how to share information online in a way that reveals their expertise, credentials, and passion in a compelling and consistent way. Recent research (Kimmons & Veletsianos, 2014) revealed that teachers strategically express different fragments of their identity, such as different identities for teaching contexts versus a family context, that they deem context-acceptable within SNS. Kimmons & Veletsianos (2014) also recognized that teachers' SNS activities are held to higher standards than those of other professionals. This section presents information to help teachers develop, manage, and maintain a positive online reputation, which leads to relationship building and meaningful collaborations with colleagues with

similar interests. Chapter 6 describes digital citizenship concerns for students, and this section helps teachers make a plan for their own online professional identity and evolving reputation.

School Policies for Online Activity

All teachers in every school must examine the existing school or district policies that will govern all online activity. The schools or districts are likely to have an **acceptable use policy (AUP)**, **website and intranet policy**, and possibly a **social media policy**. You must read and consider all of them carefully as you engage in connected learning. In these policies, you should find important guidelines governing the following topics that likely will intersect with your online activity:

- Data privacy (concerning confidential personal information, such as names, pictures, and work of students and teachers)
- Copyright of information (regarding content that you create, use, post, or share)
- Information security (pertaining to spam and malware, for example)
- **Netiquette** (relating to online behaviors)
- Employee–student relationships (concerning connections with students on social media)

The following sections highlight important guidelines for teachers' online activity. An overarching guideline is to *consider that everything you post on online spaces (even if it is marked or set as private) as publicly available information.*

DATA PRIVACY Data privacy is of great concern to children, parents, teachers, schools, and districts to ensure a safe educational environment. Personally identifiable information, such as names, birthdays, and addresses, are confidential, and sharing them in any public communication is never permissible. In some cases, parents or guardians might provide consent for pictures or other materials to be shared; however, without consent from them and the school's administration, teachers should never post any student-identifiable work or information online.

DIGITAL CITIZENSHIP Prominent people in society demonstrate negative models of online communication to children every day, so teachers must model good digital citizenship for students (Sackstein, 2017). Sackstein suggests the following strategies for teachers:

- Communicate online in the same ways you would in person
- Use positivity in communication
- Always post respectful comments
- Never post online when you are angry

ONLINE TEACHER–STUDENT CONNECTIONS Schools are moving toward providing learning experiences, such as those created with Edmodo, that mimic features of social media but remain private to the school. However, some teachers introduce lessons in which students use publicly available social media such as Twitter (Schulzen, 2013). When students have these educationally based social media experiences or are social media users themselves, they may seek online connections in public social media sites with their teachers. Before connecting, teachers should first consult school policies that might apply to student–teacher online connections. In absence of policies, researchers provide some strategies for teachers when making decisions related to connecting with students in online environments:

- Connect with either all or no students known to you, which avoids the appearance of favoritism (Gribble, n.d.)

- Connect only with students who have an educational purpose for connecting, such as a group that will be supplementing classroom learning with social media activity (Kuo et al., 2017)
- Do not connect with students unknown to you (Gribble, n.d.; Kuo et al., 2017)
- If privacy settings allow, put all students into a separate group, which facilitates posting to them as a group and prevents them from receiving other communications
- If privacy settings allow, remove the ability for students to send direct messages, which are private, to you in online platforms. This channels all communication on the public side. For example, if a teacher blocks a student from sending direct private messages in Twitter, the student would need to communicate on the public Twitter using a callout to the teacher's handle, such as @techedges.

Building a Professional Online Identity

The instant you use online media, your digital footprint begins. As a connected learner and educator, you can be proactive in managing and shaping (or reshaping if needed) your online activities to build a positive online reputation and professional **online identity** that represents you in the way you desire. Doing so will benefit you in multiple ways (Gallagher, 2015; Kilbane & Milman, 2016; Luehmann & Tinelli, 2008; Nussbaum-Beach & Hall, 2012). Kilbane and Milman (2016) and Gallagher (2015) describe building your online identity as building your teacher brand; the branding concept is meant to encourage focus and identity, not self-promotion. Kinser (2013) reiterates that branding is meant to publicize the good work that teachers and their students do and contributes to a larger collaborative conversation. Berry et al. (2013) emphasize that an online identity makes teachers and teaching visible. Creating a professional teacher brand assists teachers in becoming self-aware, reflective, confident, and knowledgeable about their strengths and facilitates sharing such strengths with others.

A teacher brand, also referred to as an online identity or simply the focus for online work, helps distinguish one teacher from another. Kilbane and Milman (2016) described the overall steps to building a teacher brand as the following:

1. **Determine your strengths**—Although your brand is generated through your online activities, considering your strengths and the nature of your interests in advance could lead you to ideas or themes of focus for your online professional activity.
2. **Choose a focal digital platform**—Monitor the digital landscape and choose the digital platform(s) where you would like to share content. For example, teachers use blogs, Twitter, Pinterest, websites, wikis, and more to generate and share content. Initially, choose to share your expertise on one digital platform, such as a web page or blog, both of which allow users to add lengthy content contributions. Many SNS sites like Twitter allow only a few words. However, the choice is yours. Post on topics about which you are knowledgeable.
3. **Build consistent, professional, digital presence**—Consistent, frequent activity is important for building followers and an online presence. Professionalism is required; do not mix personal posts on your professional platforms or you will undermine your brand (Kilbane & Milman, 2016). For example, don't tweet dog and cat photos on your Twitter account if it is focused on ELA. If you use multiple digital platforms to build your brand, ensure that there is coordination in the identity of each, such as using the same name for all accounts. You may use your own name or the theme or focus that you identified in Step 1 to help identify and represent your brand.
4. **Expand your presence using social networking**—Begin using other SNSs, such as Twitter, Pinterest, LinkedIn, and Google + to share or cross-post your content to relevant audiences.

5. **Publicize expertise**—Use of SNSs will disseminate your content to multiple viewers. As you build presence, you may offer to write guest posts for other blog sites or practitioner magazines. Gallagher (2015) encourages teachers with a digital identity to make presentations at educational conferences so they can meet followers in person and make new connections. Teachers can also track themselves or monitor ideas of interest using Google Alerts. This requires only adding their name or the ideas, and Google Alerts will email them when new content that matches their criteria is added to the web.
6. **Engage with others**—Whitaker et al. (2015) note the importance of connected educators being responsive online. Gallagher (2015) indicates that more interaction increases the potential for learning.

Teachers tend to begin engaging in connected learning activities prior to considering their digital identity or teacher brand. Gallagher (2015) described how her focus or brand shifted over time as she assumed new educational positions. Thus, it is natural for your identity or brand to evolve during your career; however, you should follow digital citizenship and any school policy guidelines when you participate online.



Check Your Understanding 3.3

A Personal Rationale for Educational Technology

Teachers must develop and continually refine their personal rationale to reflect what they believe about educational technology, which will influence the specific educational technology they explore as possibilities to solve educational challenges for the classroom. For each technology-supported lesson or unit, teachers build a more specific rationale for that curricular instance, which is scaffolded by using the **turn-around technology integration pedagogy and planning (TTIPP)** model when teachers **RATify** their technology-supported lesson to identify its relative advantage. Ultimately, cogent rationales help convince others—whether other teachers, parents, students, superintendents, taxpayers, government agencies, or private foundations—to support technology-based instruction or learning innovations.

A personal rationale for educational technology supports the teacher:

- Investigating technological possibilities for educational problems of practice by using the TTIPP model
- Establishing herself or himself as a connected educator
- Working as a leader on projects that involve educational technology

As a teacher and teacher leader, what you believe in and what you are working toward achieving in education is your vision for transformative change (Blair, 2016). A sound rationale can be built by considering the influences on educational technology integration in the classroom such as the following:

- History of educational technology
- Educational standards for digital literacy and subject areas
- Contextual conditions influencing integration
- Recent trends in emerging technologies
- Epistemologies of directed instruction and constructivist learning theory
- Educational technology research findings

Thus, rationales acknowledge what the field has learned in the past to situate a research-based, theory-supported explanation of how teaching or learning in a particular school context will (or will not) benefit from educational technology. Rationales also maintain focus on pedagogy and learning as the ultimate focal areas for any technology integration efforts. A sound rationale helps answer the question: "Why should the teacher or students use technology?" Fishman and Dede (2016) emphasize that technological infrastructure, pedagogy, and context are strong factors determining how technology can be used. Teachers' rationales directly influence their instructional choices regarding the integration of technology. Rationales for educational technology can be refined as teachers experience and learn new ideas during their careers.

A Technology-Use Rationale Based on Transformation

Research-based perspectives on educational technology inform the development of rationales for educational technology. Fishman and Dede (2016) argue that the field should move beyond considering how technology can support industrial-era educational and instead consider how technologies play a role in transforming the way that education occurs in the participatory, knowledge-based, global 21st century. This necessitates a shift from the questions "Does technology help learning?" and "Does technology improve educational outcomes over an alternative approach?" to "How does technology help learning?" and "Under what conditions can technology be used to meet important educational challenges?" The case for using technology in teaching is one that must be made not just by isolating variables that make a difference (Clark, 1983, 1985, 1991, 1994) but also by combining them. Educators and researchers have established a number of ways that integrating technology into teaching can support learning. When these contributions are combined to tackle learning needs and interests for individual students, technology seems to make the greatest difference.

HOW DOES TECHNOLOGY MOTIVATE AND ENGAGE STUDENTS? Technology in and of itself does not create motivation, but the interaction between technological media's unique attributes, such as symbol systems or processing capabilities, and the learning situations do (Fishman & Dede, 2016; Kozma, 1991, 1994). Educational technologies have been observed to motivate and engage students by:

- **Gaining their attention**—Teachers say that technology's visual and interactive qualities can direct students' attention toward learning tasks.
- **Supporting manual operations during high-level learning**—Students are more motivated to learn complex skills (e.g., writing compositions and solving algebraic equations) when technology tools help them do the low-level skills involved (e.g., making corrections to written drafts or doing arithmetic).
- **Illustrating real-world relevance**—When students can see video and online examples of high-level math and science skills being used in real life, they no longer consider the skills as being just for "school work" but are more willing to learn them because of the clear value to their future life and work.
- **Engaging students through production work**—Students who learn by creating their own products with technologies such as word processing, multimedia, and other technology products report higher engagement in learning and a greater sense of pride in their achievements.
- **Connecting students with audiences for their writing**—Educators say that students are much more motivated to write and do their best writing when they publish it online because others outside the classroom will see it.
- **Providing support for collaborative learning**—Although students can do small-group work without technology, teachers report that students are often more motivated to work collaboratively on creation projects.

Application Exercise 3.1 The Role of Engagement in Technology Integration

HOW DOES TECHNOLOGY SUPPORT STUDENTS' LEARNING NEEDS? The following are ways that technologies can support students' learning by providing access to sources and ways of learning that they would not otherwise have:

- **Visualizing underlying concepts in unfamiliar or abstract topics**—Simulations and other interactive software tools have unique abilities to illustrate science and mathematics concepts. Highly abstract mathematical and scientific principles become clearer and easier to understand through visual representations.
- **Studying systems in unique ways**—Students use tools such as spreadsheets and simulations to answer “what-if” questions that they would not be able to do easily or would not be feasible at all without the benefits of technology.
- **Giving access to unique information sources and populations**—The web connects students with ever-expanding global information, research, data, and expertise.
- **Supplying self-paced learning for accelerated students**—Self-directed students can learn on their own with software tutorials and/or virtual learning materials. They can surge ahead of the class or learn about topics that the school does not offer.
- **Turning disabilities into capabilities**—Students with disabilities related to vision, hearing, cognitive, and/or manual dexterity depend on technological assistance to read, to interact in class, and to do projects to show what they have learned.
- **Saving time on production tasks**—Software tools such as word processing, desktop publishing, and spreadsheets allow quick and easy corrections to reports, presentations, budgets, and publications.
- **Assessing and individualizing student learning**—Personalized learning systems and mobile, handheld technologies help teachers quickly assess and track student progress, giving teachers and students the rapid feedback they need to make adjustments to students' learning paths.
- **Supporting effective skill practice**—When students need focused practice in order to comprehend and retain the skills they learn, drill and practice software offers the privacy, self-pacing, and immediate feedback that make practice most effective.
- **Providing faster access to information sources**—Students use the web and email to do research and collect data that would take much longer to gather by other methods.

HOW DOES TECHNOLOGY PREPARE STUDENTS FOR THE FUTURE? The 2016 ISTE Standards for Students, the 21st-Century Learning Framework, the Common Core State Standards (CCSS), and other subject-specific national standards identify skills that students will need in the future, such as creative thinking, **multimodal** communication, research skills, problem solving, and effective reasoning. To learn these skills, students will need the following:

- **Digital literacy**—As technologies are increasingly used to store and convey information, digital literacy, or skills in using both technologies and the information they carry, is viewed as essential. For many library/media experts, digital literacy is becoming an umbrella term that encompasses **information literacy**. Also, images and video are increasingly replacing text as communication media, requiring students to learn **visual literacy**. Because images are usually carried digitally, visual literacy can be considered a subset of digital literacy.

Video Example 3.7 Creating, Thinking, and Learning with Technology

In this video, educators discuss their rationale for using technology to create meaningful experiences for children to think and learn.

https://youtu.be/6d7HRNjw_k4

- **Digital citizenship**—Schools are tasked with teaching students how to use technology resources in safe, responsible, and legal ways.
- **New literacies**—New literate practices shift from consumption of text-based media to engagement with and creation of multimodal media.

Based on Fishman and Dede's (2016) research, five general digital technologies are particularly apt to transform teaching and learning environments assuming that a teacher's technological infrastructure, pedagogy, and classroom context are sufficient and complementary. In these innovations, all of which are described more fully later in this book, consider the earlier answer to the question: "How does technology help learning?":

1. **Collaboration tools**—These include a spectrum of tools, such as web 2.0 technologies, wikis, and social media, that leverage socioconstructivist learning to support **problem-based learning**, knowledge-building, distributed knowledge networks, communities of practice, connected learning, and authentic assessment.
2. **Online and blended learning**—Courses that include **online learning** and **blended learning** reduce reliance on place-based and time-based learning, and their inclusion is growing rapidly within K–12 education. These approaches to learning can vary from directed to constructivist, but courses in which a teacher interacts prominently with students and that involve teacher and social presence contribute to increased meaningful practice.
3. **Making and creating**—**Making** and creating activities draw learners to engage in **computer programming**, which develops **computational thinking** skills. Often learners engage in self-directed learning, employing their own creativity to make shareable artifacts.
4. **Immersive environments**—These environments, such as **multi-user-virtual environments (MUVEs)**, **augmented reality**, and **virtual reality**, engage users in the sense of "being there," drawing them into the virtual realism being depicted. In these environments, users face ill-structured challenges that can be solved by learning, applying knowledge, and problem solving.
5. **Games and simulations**—Nonimmersive **serious games** and **simulations** approximate real phenomena and allow users some level of control and interaction with the phenomena, including its representations and processes, that might not be observable in real life.

Consider these research perspectives on using technology in teaching in addition to the research you read about in this book to help you form a cogent, powerful rationale for why technology must become as commonplace in education as it is in other areas of society.



Check Your Understanding 3.4

Shared Writing 3.1 Your Personal Rationale

Chapter 3 Summary

1. Teacher Leadership

- Teacher leaders are classroom teachers who engage in leadership activities outside their classroom that identify educational challenges that they work to solve.
- Teacher leadership is enabled by three crucial mindsets: creativity, agency, and community.
- Benefits of being a teacher leader include better relationships among colleagues, confidence and empowerment, growth as a professional and in professionalism within the school, and expansion of leadership activities.
- Challenges of being a teacher leader include stress, lack of time, too many tasks, suffering relationships with colleagues, and resistant colleagues.

2. The Connected Educator

- Connected educators are teachers who engage in learning with others online via networked technologies.
- Connected learning communities facilitate professional learning through four offline and online sources: (1) conferences and meetings, (2) professional learning communities (PLCs), personal learning networks (PLNs), and communities of practice (COPs).
- A range of networked technologies support connected learning communities for socially connecting and collaborating with other professionals and documenting, archiving, and creating information.
- Strategies to become a connected educator include investing time in developing a professional network, scheduling time and time off from networking, promoting other people, responding to connected people, trusting others, building relationships, and modeling connected learning.
- Benefits of being a connected educator outweigh the challenges. Benefits include motivation to learn, inspiration, autonomy and agency, innovation,

status, feedback, access to others, personalized learning, and relationships. Challenges of being a connected educator include need for the Internet and time.

3. Online Teacher Identity

- Teachers develop a digital footprint when using networked technologies and need to manage their online activities to create a consistent and compelling online identity.
- Teachers must consult their school's policies related to technology and online activity to understand important guidelines affecting their online activity. Special attention should be given to data privacy, digital citizenship, and teacher–student connections.
- Connected educators can manage and shape their online activity to build a professional online identity by determining their strengths; building consistent, professional digital presence; and using social networking to publicize their expertise and engage with others.

4. A Personal Rationale for Educational Technology

- A personal rationale regarding educational technology benefits teachers, educators, and teacher leaders. To build your rationale, consider the history of educational technology, educational standards, contextual conditions, emergent technologies, learning theories, and educational technology research.
- Educational technology research answers questions related to what unique impact technology has on student achievement and the conditions under which technology can be used to meet important educational challenges.
- Educational technology research has identified how technology helps learning. These include ways in which it motivates learners, helps address learning needs, and prepares students for the future. These insights can be used to build a rationale for educational technology based on transformation.

Technology Integration Workshop

1. Apply What You Learned

You have read in this chapter about how teachers can become connected educators who learn and lead toward the goal of transformative technology integration. Now apply your understanding of these concepts by completing the following activities:

- Reread Ms. Alkhouri's and Ms. Read's experience at the beginning of the chapter. Reflect on their experience and determine the ways in which they were teacher leaders and connected educators.
- In what way did they serve as teacher leaders? What benefits and challenges of teacher leadership did they experience?

- What activities and actions reflected their roles as connected educators? What connected learning communities did they access? What benefits and challenges of being connected educators did they experience?
- From what you read, infer Ms. Alkhouri's and Ms. Read's personal rationale for integrating educational technology in teaching and learning. How might each of them answer the question "Why should teachers or students use technology?"

2. Technology Integration Planning: Preparing to Be a Connected Educator

Complete the following exercises.

- Locate acceptable use policies governing web-based activities such as an AUP, a social media policy, or website policies of your university or teacher education program you attend or the school where you teach. Read them. How do they help you think about your responsibility as a digital citizen when you engage in connected learning now or in the future?
 - (Note: No Twitter account is necessary for this exercise.) Go to the Twitter website home page and click on the Search icon (looks like a magnifying glass). Choose a hashtag (see the following for ideas) related to an educational interest and search for it.
 - Some hashtags to consider using include #edtech, #edchat, #sschat, #engchat, #makered, #mathchat, #scichat, #ell, #arted, and #specialneeds.
 - The default results will show you the "top" posts, but you can click on the menu options along the top to find the "latest" posts, or "people," "photos," "videos," "news," or "broadcasts" related to the hashtag. Examine the content of posts. What type of content are people sharing on this hashtag topic? Characterize the information.
- Find three posts made by teachers using the hashtag you chose (hover your mouse over the post's username also known as a handle, and more information about the account owner will pop up) and characterize the nature of what they are sharing. What type of content are teachers sharing on this hashtag?
- Locate a free online community of practice or professional learning community that matches your interest area, such as a subject or pedagogical approach. Consider COPs or PLCs sponsored by content area organizations, such as National Council of Teachers of English (NCTE), National Council of Teachers of Mathematics (NCTM), National Council for the Social Studies (NCSS), or National Science Teachers Association (NSTA) (membership may be required); visit edWeb.net; or seek suggestions from your instructor.
 - Choose a topical strand within the online community that interests you and read the posts that occurred over a week's time.
 - Describe the week's discussion that you examined. Based on your observations, what are the benefits or challenges for teachers participating in this community?
 - How might you benefit from making a connected learning community, such as the one you examined in this activity, a part of your professional learning activities as an early career teacher?