Resources and Support for the Online Educator

A Curated Collection from ISTE Books

ISTE®

Dear Reader,

We on the ISTE Books Team would like to express our appreciation of both you and the work you do helping students learn, and to offer our support during this difficult time.

We feel that our authors are uniquely equipped to support other educators due to their deep expertise in areas like online learning, media and digital literacy, myriad tech tools, and so much more. So, to help you continue to do the great work you do, we have assembled a collection of excerpts from some of our books that contain strategies, tips, and insights to help you navigate a landscape of online learning.

The activities and tools were selected because they were designed for an online or home situation, or can be easily adapted for such environments. We are also including material to support you in terms of well-being and self-discovery, through a lens of technology use.

We've organized the material into three parts:

• **Part 1, Online Learning and Accessibility,** provides guidance for making lessons accessible, using tech tools to teach online, exploring issues such as equity, digital literacy, and more.

• **Part 2, Creativity,** focuses on content designed to keep students creatively engaged, with projects and ideas that can be applied outside of a physical classroom.

• **Part 3, Well-being and Mindfulness,** offers material on self-reflection and gratitude, to help educators deepen their teaching practice and remain healthy in the process.

Many of the selections are full chapters, with a few shorter selections from chapters as well. (At the end of this ebook, you'll find links to the complete books for further reading.) We hope this resource can serve as a practical guide to help keep you and your students healthy, engaged, and informed.

We welcome your feedback and requests for material that we can offer; if you have suggestions of what type of content you would like to see in this kind of resource, or in future books, please don't hesitate to reach out to us at booksdept@iste.org. As always, we are here for you as we continue to produce content to help educators and students learn.

With gratitude,

The ISTE Books Team

Author Statement

We as fellow educators hope this resource can provide some support and guidance during this period of uncertainty. We stand by you and wish you the best in continuing to do the great work you do for your community.

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PART 1

Online Learning and Accessibility

The Perfect Blend

A Practical Guide to Designing Student-Centered Learning Experiences

MICHELE EATON

The following excerpt is from this book.
Check out the complete book at iste.org/PerfectBlend

Designing Digital Content for All Learners

By the end of this chapter, you will:

- Know the rationale and legal obligations behind accessible digital content

- Understand the nine elements of accessible digital content

ISTE Standards

This chapter addresses several ISTE Standards for Educators.

2. Leader

Educators seek out opportunities for leadership to support student empowerment and success and to improve teaching and learning. Educators:

b. Advocate for equitable access to educational technology, digital content and learning opportunities to meet the diverse needs of all students.

c. Model for colleagues the identification, exploration, evaluation, curation and adoption of new digital resources and tools for learning.

5. Designer

Educators design authentic, learner-driven activities and environments that recognize and accommodate learner variability. Educators:

c. Explore and apply instructional design principles to create innovative digital learning environments that engage and support learning.

What Is Accessibility and Why Is It Important?

As we design digital content for our classroom, we also need to make sure those materials are accessible to all students. According to the organization Be Accessible, "accessibility is all about our ability to engage with, use, participate in, and belong to the world around us" (n.d.). At the heart of it, accessibility is about equity of access and ensuring that all students have a level playing field from the start. We do this by ensuring that all students can interact and engage with our digital content from the beginning.

Not only is it our obligation as teachers to create accessible digital content, it is also the law. The Americans with Disabilities Act and Section 504 of the Rehabilitation Act both give us guidelines about accessibility specifically to meet the needs of students with disabilities. These federal laws state that no student should be denied access to any learning activity. To ensure that students are not discriminated against because of their disability,

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the law says that content should be readily accessible. Essentially, the laws state that students with disabilities should have equal access to the same opportunities as all students.

Accessibility versus Accommodations

When we make our digital content *accessible*, we are taking a proactive approach. Accessible content is content that most students can engage with immediately, regardless of their unique needs or abilities. On the other hand, *accommodations* involve the changes to content and assessment that we make during instruction that is unique to a student and cannot be addressed proactively.

Designing our digital content to be accessible does not eliminate the need for accommodations for our learners. However, if we only ever rely on accommodations, we create roadblocks and obstacles for students that prevent them from having equitable opportunities for success. We never know when a student with a disability of some kind will be placed in our classes. Taking that a step further, some of our students may have undiagnosed or undisclosed disabilities that we may not know about for some time (or ever). Those students deserve immediate access to the learning materials from day one. If we rely solely on accommodations, these students cannot begin their work immediately, because they have to wait on the adults to update the content so they can access it. This puts students at a disadvantage when they do not have equal access from the start.

When we design with accessibility in mind, we are prepared for any student that walks in our door. Additionally, while we rarely teach the same lesson year in and year out, it is not unreasonable to think you may want to reuse and remix the digital content you design. This is another reason to design for all students now, regardless of who you have in the room this year, so you can be prepared for future classes no matter what.

Design for the Nine

Designing accessible content certainly takes a bit more time than designing without accessibility in mind. However, it is a lot easier to design proactively and accessibly than to reactively "fix" content when a student that cannot engage with your content as-is joins your class. As you read this chapter, consider the differences in workload that it would take to retroactively fix issues with inaccessible design versus designing with all students in mind from the beginning.

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While you create digital materials for your students, you should consider the nine elements of accessible content:

- Text formatting
- PDF readability
- Use of color
- Animations and visual effects
- Hyperlinks

- Images
- Math equations
- Keyboard navigation
- Video captions and transcripts

Let's take a look at each element in depth.

Text Formatting

Text is often a dominant aspect of many digital lessons. Inaccessible text can quickly compromise learning if steps are not taken to ensure all students can access this content.

Headings and Styles

Headings provide visual cues to navigate a text. As you are reading this book, for example, you probably are using the headings and subheadings. If you go back in the book to review or reread something you read, you are likely to use them to search for the particular section you are looking for. As you read a website, you may not read the entire page if you are looking for one piece of information. Headings and subheadings are handy for skipping through a text to find specific information.

However, a person who is using a screen-reader on a website or digital text because they have low vision or blindness cannot see that visual cue. They rely on technology to help them navigate the page. It is important to make sure our headings and subheadings can be identified by a screen-reader so a person with impaired vision can navigate the text efficiently.

The problem with this is we cannot simply create headings by making the words bold or larger. Screen-readers do not distinguish normal text from bold or italic text. They don't let the reader know that some text is larger than others. They just read the words. So, in this instance, a student who wanted to go back to the text to find some information for an assessment, for example, would have to listen to the whole text again. They would not have the ability to quickly identify headings to pinpoint specific sections of text.

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The simplest way to make headings and subheadings accessible is by applying *styles* to text, which you can do from the Styles menu (sometimes called Paragraph Styles) in your word processor (Figure 10.1). Instead of making a heading stand out manually by changing the font size and formatting, select the style that corresponds to the heading's place in your document's hierarchy (Title, Subtitle, Heading 1, Heading 2, etc.).

10.1 The Styles menu in Google Docs
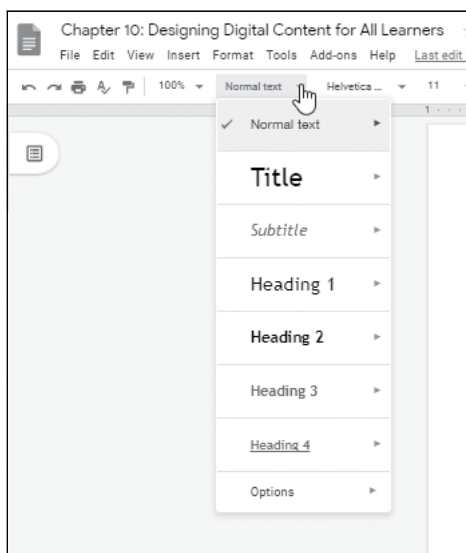
If you are working in a text box inside a learning management system that does not have style options to structure your heading hierarchy, all is not lost. Often, you can type and style the information correctly in Microsoft Word or Google Docs and paste that text into a text box while still retaining the heading code. One way to test this is to check the source code of the text box after you copy the information over. When headings are styled correctly, tags are added around them (<h1> and </h1> surrounding Heading 1 text, for example). If you see these tags, you know the heading is accessible.

Font Choices

It is important to choose fonts that are easy to read. Making your font choices accessible improves legibility for all users, not just those with vision impairment. Stick with simple fonts that are widely available on all devices. In general, texts with one font (two at most) are the easiest to read. Some fonts were actually designed specifically for the web, such as Verdana,

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Tahoma, Trebuchet MS, and Georgia, while others, such as script and novelty fonts, make on-screen reading extremely difficult. Avoid the latter, and also avoid writing sentences in all capital letters. Not only does writing in capitals look like you're yelling, but it is harder to read text written this way.

If you would like more information about font choices and accessibility, I recommend checking out the WebAIM (Web Accessibility in Mind) resources available at **webaim.org/techniques/fonts**. WebAIM is a non-profit organization that provides expertise, guidelines, and tools for designing accessible digital content.

WEBAIM

PDF Readability

Students using screen-readers must also be able to navigate PDF files, and not all PDFs are created equal. Consider a PDF file of a magazine article, for instance. It could either contain scanned images of each page of text, essentially static "pictures" of the pages, or a searchable copy of the article's text. A screen-reader can read a PDF only if it contains searchable text, not a static image of a document.

So how do you know if a PDF contains searchable text and, therefore, is accessible? Try a quick test: Open the PDF and try to highlight the text. If you can highlight individual words, the PDF is likely accessible (Figure 10.2). Another easy test is to use the Find function to search for a word that you see on the screen. If you can find the word using the Find function, then a screen-reader can read those words, too.

PDF readability is a great example of how proactive accessible design is much easier than trying to fix issues later. Imagine you are designing a digital lesson and want to use a particular PDF. If you find that it is inaccessible, you simply don't use it and use an alternative resource instead. If you use an inaccessible PDF in a digital lesson and try to make the lesson accessible later, that is a bigger problem, especially if you have designed assessments that go along with that document. In this instance, you have to either find that exact document in an accessible format, redesign the lesson with a new resource, re-type the information from the PDF, or find another way to convert the PDF to accessible form (see the "Microsoft Office Lens" sidebar). Taking that extra step now could help save you some time and frustration in the future.

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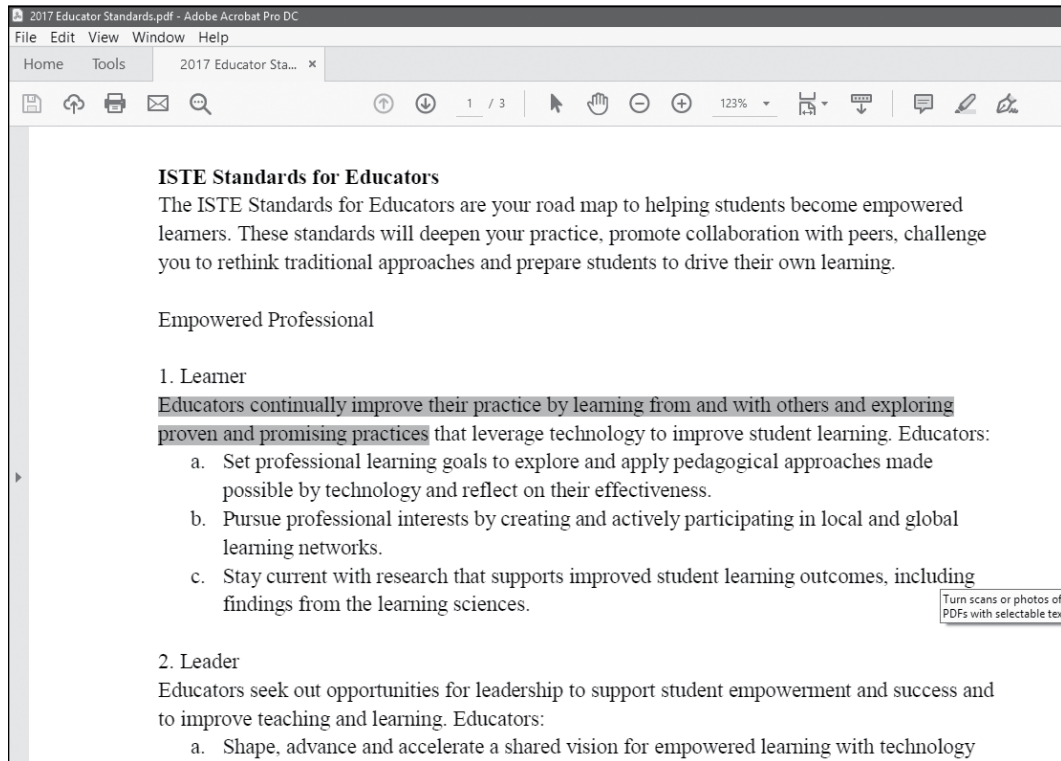
10.2   Because I can highlight individual words and sentences in this PDF of the ISTE Standards for Educators, I know this PDF is accessible.

Use of Color

The way you use color in your digital content can quickly make your online lessons inaccessible if you're not careful. When you design, always consider the contrast between the background and the text, as well as how you use color to indicate action.

Color Contrast

When you add color to your online lessons, be sure to maintain a high contrast between the background and foreground colors you choose. As a general rule, any time students are reading content that is more than a few words, you should use a black font on a white

Microsoft Office Lens

MICROSOFT OFFICE LENS

Microsoft offers a great free tool to help make PDFs accessible. Microsoft Office Lens scans images or PDFs with text, then uses the Microsoft Immersive Reader tool to make the text readable and editable, even if the original PDF is not accessible. For more information, see **bit.ly/officelens**.

background. If you are creating slides or an image with just a few words on it, colored text is okay if there is still a high contrast present, but most text in your digital content should be black. Some students with a vision impairment may benefit from a black background with white text because of the glare a white background produces. This is a case when an accommodation for those students would be the best solution.

WebAIM Contrast Checker

CONTRAST CHECKER

One of the resources on the WebAIM website is the Contrast Checker, which can be a lifesaver when you're choosing colors for presentations, posters, images, and the like. It checks the background color and the foreground color for accessibility and lets you know if your color combinations have a high enough contrast. You can try it at **webaim.org/resources/contrastchecker**.

EYE DROPPER

To specify a color, you can enter its hexadecimal code in the text box or click the colored box under it to select a color from the color picker. With the help of a third-party eyedropper tool, you can also sample a color from an image, website, or document (I use the Eye Dropper Chrome extension from **bit.ly/eyedropext**). After you enter your colors, Contrast Checker shows you a sample of the combination for normal text and large text, as well as information on whether the combination passes the Web Content Accessibility Guidelines (WCAG) levels of conformance.

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For example, Figure 10.3 shows the Contrast Checker in action, evaluating my green foreground color for text and navy blue background color. Let me explain what the results mean. The WCAG have three levels of conformance: A, AA, and AAA. Level A is the minimum legal compliance for accessibility, and AAA is the highest level of compliance. (The WCAG contain standards for all of the nine elements in this chapter, plus others.) My green and navy blue combination conforms for both levels for large text but not the AAA level for normal text.

10.3 The WebAIM Contrast Checker tests a combination of two specified colors for conformance with the Web Content Accessibility Guidelines. View the full color image at **bit.ly/webaimcc1**.

Video accessibility, which we will discuss in detail later, is a great example to showcase how the three WCAG levels build on each other. For a video to be compliant at level A of the guidelines, it must have accurate closed captions. Level AA states that even live video needs to have accurate closed captions and recommends including a transcript of all audio and video. Level AAA includes all of the above plus an additional video of the content being signed in American Sign Language.

It may not always be possible to reach Level AAA of the Web Content Accessibility Guidelines for all of your digital content, and that is okay. When it comes to color usage, though, I generally try to reach the highest level because it is not that difficult to do. The only difference between Level A and Level AAA is a higher contrast between colors.

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While Figure 10.3 demonstrates a moderately successful combination that passes for normal text at Level AA and for large text at Level AAA, Figure 10.4 demonstrates what it looks like when the color contrast is too low and fails the checker. Even if you have perfect vision, those colors are hard to look at when together. This is another example of how designing for accessibility benefits everyone.

10.4 This pink and yellow combination does not have a high enough contrast to be accessible at any WCAG level. View the full color image at **bit.ly/webaimcc2**.

Contrast Checker

Home > Resources > Contrast Checker

Foreground Color
#FF80C0

Lightness

Background Color
#FFFF00

Lightness

Contrast Ratio
2.14:1

permalink

Normal Text

WCAG AA: **Fail**
WCAG AAA: **Fail**

The five boxing wizards jump quickly.

Large Text

WCAG AA: **Fail**
WCAG AAA: **Fail**

The five boxing wizards jump quickly.

Graphical Objects and User Interface Components

WCAG AA: **Fail**

✓

Text Input

Try It with Students

Why not show the Contrast Checker to students, too? If you have ever had students design anything online, I can almost guarantee you have experienced inaccessible color combinations. They are definitely not fun to grade either! Have your students bookmark the WebAIM Contrast Checker on their devices and use it before submitting any work they design. It will be easier for you to view later, but more importantly, it will teach students valuable lessons about accessibility. It is unlikely that students will go through life without creating content for others. It is a valuable skill to learn at any age that we must design for *all* users in mind, not just some.

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I have also used this tool with young students. They do not have to understand what WCAG stands for or even about color codes. If they can select colors from a color picker, they can see that green means their colors work together and red means they are too hard to read when paired together. Even our youngest learners can begin to learn about accessibility.

Animations and Visual Effects

Animations and visual effects can liven up your lessons or turn them into an accessibility nightmare.

Flashing Content

Certain animations and visual effects can be detrimental for people with seizure disorders, and because of this the Web Content Accessibility Guidelines state that page content should not contain objects that flash more than three times per second. Personally, instead of trying to count flashes per second, I tend to be a bit more conservative with flashing or blinking content. I avoid it altogether, just to be safe. Ultimately, flashing or blinking on a page is likely to be a distraction from the content we are delivering to students anyway.

As you are directing students to websites, be sure to:

- Remove any flashing or blinking animations.

- Change transitions in presentations to slow, simple animations.

- Avoid using websites with flashing content or ads.

ADOBE ACROBAT DC

What if because you can't find an equivalent resource to offer students, you need to direct them to a web page with flashing content or advertisements? Download the page as a PDF to eliminate the flashing while preserving the content students need. Several Chrome extensions enable you to convert a web page to a PDF, such as Adobe Acrobat DC (**bit.ly/ adobeext**). Many of these extensions allow you to delete aspects of the web page from the PDF, like unwanted ads, for example. When doing so, be sure not to delete information about the website and authors so as not to create confusion about who the content belongs to.

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RSS Feeds

RSS feeds on websites are another source of movement and one students must be able to stop. RSS feeds are embedded widgets that can show activity streams on Twitter, Facebook, blogs, and so on; when new posts are made, the feed scrolls through new content. You may have one on your school or classroom website. When sending students to a website that has an RSS feed, make sure all widgets have a pause option. All users should have the option to pause the automatic movement from those feeds. If that is not available, you may want to find a different resource or turn the website into a PDF as described above.

Hyperlinks

You can even create your hyperlinks in a way to be accessible for all users. To do so, be sure the hyperlinked text always describes the contents of the link. Someone using a screen-reader should be able to know exactly what to expect when clicking on a link without reading any contextual information around the link. For that reason, hyperlinking phrases such as *click here* or *this link* are inaccessible and should be avoided. Figure 10.5 shows examples of correct and incorrect ways to hyperlink. The hyperlink should be able to stand alone with no content and the user would still know what they are clicking on.

10.5 One accessible hyperlink and two examples of incorrectly hyperlinked text

For a similar reason, it is rarely appropriate to leave a URL as is without hyperlinking to a phrase. Imagine a screen-reader trying to read that third link in Figure 10.5! You will want to avoid using URLs by themselves because a screen-reader will read each individual character listed. That could get really long depending on the URL.

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Images

Students who are unable to see the screen have no way of knowing what an image shows unless a screen-reader "reads" it to them. If we are effectively using images in our digital designs, the visual media we choose should have instructional value. For this reason, we have to make these images readable so all students can benefit from them, even if they cannot see them on the screen.

Alt Tags

Any time you use an image, you need to add what are called *alt tags* or *alternative text* to it. Alt tags are descriptive pieces of text that are not visible on the screen but are used by a screen-reader. Students viewing the page without a screen-reader will not see this text. When students access the page with a screen-reader, however, it will read the text listed in the alt tag, describing the image for students.

Although the process for adding an alt tag varies depending on the tool you are using, the tools you need are generally found where you adjust formatting options for the image. Sometimes, you can add alt tags when you initially add or upload an image; learning management systems often offer this option. In Google Slides and Docs, though, you can just right-click an image and select Alt Text from the resulting context menu.

No matter what steps your software requires, the need for descriptive alt tags remains the same. It is worth the investment of time to find how you can add alternative text to ensure that the images you use are accessible to all students.

Longer Image Descriptions

Alt tags are sufficient for short descriptions, but some images may require a longer description than normal. For instance, charts, graphs, and infographics carry a ton of instructional content. For these, you are better off supplying the information in an online collaborative document and adding a descriptive hyperlink to the text version below the image. Essentially you would be creating a transcript of the image.

Please do not let this deter you from using infographics, charts, or tables in your digital content. These types of visual media can be great ways to convey information and make excellent additions to online lessons. As a matter of fact, if you are designing your own

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Accessibility on Twitter

Did you know accessibility matters even on social media?

If you are on Twitter or another social media platform that utilizes hashtags, write those hashtags in *camel case* so they can be easily read by a screen-reader. Like humps on a camel, each word of the hashtag should start with a capital letter. A screen-reader would then read #LikeThis as "hashtag like this." Conversely, if a screen-reader encountered the hashtag #notlikethis it would not know where each word began and would have to read each individual letter. Avoid hashtags that are all lowercase.

Do, on the other hand, turn on image descriptions or alt tags for the images you share with your tweets. To turn this feature on (it's off by default), first navigate to Settings and Privacy on Twitter. Select Accessibility and turn on Compose Image Descriptions (Figure 10.6). Now when you tweet, you will see an additional option to add an alt tag to the images you post.

Accessibility

Image descriptions	☑ Compose image descriptions
	Adds the ability to describe images for the visually impaired. Learn more.
Video Tweets	☑ Video autoplay
	Videos will automatically play in timelines across the Twitter website. Regardless of your video autoplay setting, video, GIFs and Vines will always autoplay in Moments. Learn more.

Save changes

10.6 Twitter's Accessibility settings

When you know better, you tweet better.

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infographics or images, it can be helpful to plan them out in an online collaborative document. If you create a storyboard or rough plan of the graphic before you begin designing, that document can serve as a transcript of the image later. The planning will help you design efficiently, while serving a dual purpose.

Math Equations

Math and science formulas and equations must be readable by a screen-reader. If an equation is displayed as an image, though, it may not have the proper alt tag to be recognized by a screen-reader. There are three options when creating accessible equations or formulas.

- If equations are saved as an image, add an alt tag to each image with the math equations and symbols typed out in words. Imagine how a screen-reader without an understanding of math might read the formula.

- Use an equation editor tool that has the MathML designation. MathML is an accessible equation writing language.

- Use Microsoft Word documents for worksheets with equations instead of PDFs. Word's equation editor is accessible. Developing equations directly within your learning management system is also a good idea, assuming you can verify that it uses an accessible equation editor within the platform.

Just like with PDFs, if you can highlight individual terms in an equation in your digital content, the equation is likely accessible. On the other hand, if highlighting the equation produces a box around the entire formula, the equation is probably an image that would require an alt tag to be accessible.

Keyboard Navigation

If a student struggles with fine motor movement, using a mouse or trackpad to navigate a website can be next to impossible. For a website or a piece of digital content to be accessible, a person must be able to successfully navigate the page using only the keyboard.

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Accessibility Checkers

Several tools are available to help you check your documents and websites for accessibility. You may not need to use a checker on a document that you have designed, as you will know if you added alt tags, used proper headings, selected accessible colors, and so on. However, I do like to use these, especially for content that is shared from other teachers. Before using a document or digital lesson that was designed by someone else, I run it through one of these accessibility checkers to see if there are any issues I need to correct before delivering the material to students:

GRACKLE DOCS

Grackle Docs. Grackle Docs (**grackledocs.com**) is a G Suite add-on that can be used in Google Docs, Slides, or Sheets. Run this add-on while you have the document open to flag any accessibility issues with the text, colors, links, or images. For a short tutorial, check out the video at **bit.ly/grackledocs**.

GRACKLE DOCS TUTORIAL

Microsoft Accessibility Checker. When working with Microsoft products, you can use their built-in accessibility checker. Simply select the Review tab and then choose Check Accessibility to check for accessibility errors and receive recommendations for how to correct them. You can also keep the accessibility checker on while you work, and it will keep you updated about errors in real time.

WAVE   **WAVE EXTENSION**

WAVE Web Accessibility Evaluation Tools. WebAIM offers a group of accessibility checkers called WAVE **wave.webaim.org**. You can check the accessibility of a link by entering it on the WAVE page of the WebAIM website or install an extension in Chrome or Firefox (**wave.webaim.org/extension**).

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To test a website's keyboard navigation accessibility, try:

- Pressing the Tab key to navigate from button to button on a site

- Pressing Shift+Tab to go back to the previous button or link

- Pressing the Spacebar or Enter key while a link is selected to activate that link or button

Fortunately, if you are creating documents in Microsoft Office or Google, you can rest assured that those platforms have accessible navigation. Most popular learning management systems also have platforms that are accessible without the use of a mouse. Navigation accessibility becomes more of a question when you direct students to outside websites. However, it does not take much time at all to check a site before providing the link to students.

Video Captions and Transcripts

As mentioned previously, to be legally compliant and meet Level A requirements under the Web Content Accessibility Guidelines, all pre-recorded videos must have accurate subtitles or a transcript available. These can be manually added or automatically generated, as long as they are accurate. Captioning or transcribing videos will most likely be your most time-consuming task when making sure your digital materials are accessible before delivering them to students.

Although YouTube can automatically generate captions, remember that voice-to-text automation is not perfect. If you are using a YouTube video, check all of the captions for accuracy.

If you upload your own video to YouTube, you can edit the automated captions or create the subtitles yourself. Editing the automatically generated subtitles and just correcting the mistakes is a fairly efficient way to create accurate closed captions. Keep in mind, though, that you have no control over the subtitles in someone else's video. If you are using a video platform where closed captioning is not available or if you are using someone else's video with missing or inaccurate subtitles, you can type a transcript of the video in an online collaborative document and link it below the video.

We discussed in Chapter 8 how creating your own videos can be helpful for your learners as they engage with the digital lessons you develop. Doing this can also save you the time and hassle of transcribing someone else's video. Not only can you edit automatically generated

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Google Closed Captioning Tools and Strategies

In addition to the tools built into YouTube, you can also use Google tools to help with various closed-caption and subtitle tasks:

- **Voice to Text in Google Docs.** The Voice Typing tool in Google Docs enables you to create a transcript of a video when you use it strategically. From the Tools menu, choose Voice Typing to turn on the voice-to-text feature, and then play the video you need a transcript of. Google Docs will transcribe what it hears from the video into a document. You can then edit the document to correct any inaccuracies. Using this feature allows you to re-create YouTube's automatically generated and editable closed captions.

- **Real-Time Closed Captioning in Google Slides.** Google Slides now has automated closed captioning that you can use in real time. When you are in Present mode, click the CC option at the bottom and choose your font size. This is great for presentations or lectures using Slides and is *surprisingly accurate*.

- **Live Captions in Google Meet.** Google Meet is Google's videoconferencing tool, and it now supports live captions for online meetings. You can use this if you are meeting with a student or a guest speaker and need to provide subtitles of the conversation.

subtitles with ease, you can also plan ahead to lighten the load. When creating your own video, you could write the transcript before recording. Doing this will help you stay on topic and keep the video concise. You can also then use that script as a linkable transcript after creating the video.

Know Better, Do Better

After reading this chapter, you might be feeling overwhelmed. I know I felt that way when I learned about accessibility. My first thoughts went to all of the content I had created before that I knew was inaccessible. I wanted to immediately fix everything I had ever done, and that feeling caused stress and anxiety. How was I ever going to fix all of that content?

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Allow yourself some grace. You may never be able to change everything you have ever created for students. I recommend focusing your attention on the future and the materials you create and curate moving forward.

10.7 The words of poet Dr. Maya Angelou apply to your work with accessible digital content. When we know better, we do better.

Chapter 10 Key Points

In this section, the important takeaways from the chapter are paired with the ISTE Standards for Educators that inform them.

- Accessible content is content that almost all students can engage with immediately, regardless of their unique needs or abilities. On the other hand, accommodations involve the changes to content and assessment that we make during instruction that are unique to a student and cannot be addressed proactively. (Educator 2b)

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- It is our responsibility as educators to ensure that the content we deliver to students is accessible, both because of a legal obligation and because it is what is best for our students. (Educator 2b, 2c)

- The nine elements of accessibility to consider for your digital content are: text formatting, PDF readability, color, animations and visual effects, hyperlinks, images, math equations, keyboard navigation, and video captions and transcripts. (Educator 2b, 5c)

- Although you may not have the time to go back and fix all of the digital content you have created up until this point, you can focus on making sure the digital materials you create moving forward are all accessible. (Educator 2b, 2c, 5c)

Reflection

After reading Chapter 10, take some time to consider how its ideas apply within your context using the questions below.

- How accessible are your color combinations? Try out the WebAIM Contrast Checker to test colors you have used in a recent presentation or test the colors of some of your favorite Microsoft PowerPoint or Google Slides themes.

- What are some examples of accessible and inaccessible hyperlinks you've added to your lessons? How would you change them? What examples can you find online?

- How accessible is the navigation for your favorite student websites or even your classroom website? Can you move through the page without the use of a mouse or trackpad?

- What aspects of accessibility could you reasonably teach students about as they create in the classroom?

Share your reflections and thoughts online using the hashtag #PerfectBlendBook.

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AWESOME Sauce

Create Videos to Inspire Students, Engage Parents and Save You Time

JOSH STOCK

The following excerpt is from this book.
Check out the complete book at iste.org/AwesomeSauce

CHAPTER

9

Video Tips

TOP *10*

1. Limit your retakes.
2. Use plenty of guests.
3. Create a YouTube channel to house all your videos.
4. Create playlists in YouTube for different purposes.
5. Purchase a decent tripod (around $50).
6. Be aware of where you are looking when you are recording. If you use a script, tape it as close to the camera as possible.
7. Record in a location with the best sound options.
8. Invite students to help record videos.
9. Record everywhere.
10. Do it.

TOP 10 *Expanded*

1. Limit your retakes.

Five years ago, I didn't have a YouTube channel. I didn't record videos or post them online. I didn't do *anything* with video. Why?

I was afraid.

I was afraid that I would stutter, or that I would say "um" through the whole thing. I was afraid that students wouldn't like it or that I would look stupid. Fear kept me from creating epic content for my students.

Then something changed. I decided to just try recording videos. I recorded my first video, and it wasn't great. I was afraid to share it with my students, so I rerecorded it twenty times. Finally, I thought I had a perfect video I could share with them. I was wrong. I still made mistakes. But an interesting thing happened: The kids loved it. They didn't care that I messed up. In fact, they loved seeing that I make just as many errors as they do. After that, I refused to rerecord a video more than three times, and I stick to that rule to this day.

If you spend your time worrying about what will go wrong, you miss out on all the ways things could go right. You miss out on all the awesome opportunities your videos could open up for your students. Don't be afraid. Embrace the imperfections. Enjoy it!

2. Use plenty of guests.

Most students have that one adult in the building they connect with, the one who listens to them and knows them best. It may be you, or it may be the secretary in the front office, or it may be the art teacher. The important thing is to try to include as many of these people in your videos as possible. Getting other adults involved in your videos gives you the best chance to engage students. It also makes your life easier. And your guests don't always have to be "real" people from your school—Batman may have shown up in my videos once or twice.

3. Create a YouTube channel to house all your videos.

You need a hub for all these amazing videos you are creating, a one-stop shop for anything that might benefit your students. You'll be shocked at the number of students who come into your class for the first time and can already tell you a lot about your class and upcoming lessons. They will stalk you. They will look through every video you've posted.

It. Is. Awesome.

YouTube is also a great way to stay connected to students and parents. Share your YouTube channel link with parents and encourage them to subscribe. If they do, they will automatically get notified when you post something new. This will always keep them up to date with the most recent happenings in your class.

YOUTUBE PRIVACY SETTINGS

YouTube currently has three settings for posting videos:

1. **PUBLIC:** This is usually the default setting. It allows you to post videos for anyone to see. These videos are searchable.

2. **UNLISTED:** These are videos that can only be viewed by clicking on the video link directly. These aren't searchable and are generally secure. The only concern is that the person you share the link with could also share the link with someone else without your knowledge.

3. **PRIVATE:** These videos can only be viewed by inviting the user to view the video through an e-mail invite. This is the most secure setting, but at the moment only fifty people can be invited to view a video at one time.

4. Create YouTube playlists for different purposes.

If you're like me, you overload your channel with videos. If you post too many different videos, students and parents won't know which ones they should watch. So, put the most important ones in playlists, which help you to keep them organized by type.

I create videos for teachers, parents, and students. Students don't care about the latest features in the gradebook program, just like teachers don't care that Dr. Vonn Stock is using similes and metaphors to attack a pirate ship.

5. Purchase a decent tripod (around $50) and use it.

I have a hard time following this piece of advice. If you look at a lot of my videos, especially my daily announcements, you'll notice that a lot of them are shaky. I usually forget to set up my tripod, and that's the result. For a quick announcement video I'm not too concerned, but for more important videos I like to make sure to set up a tripod. It gives the video a more polished feel and makes it easier for students to watch.

Most tripods come with various attachments to let you switch between different devices. I have one for my phone and one for my iPad. The tripod I'm currently using (my second one) was about $50 on Amazon. My first one broke. Apparently if you fall down some stairs with it, the tripod might break. (Thankfully there was nobody there to see it happen.)

6. Be aware of where you are looking when you are recording. If you use a script, tape it as close to the camera as possible.

Be aware of where the camera is located on your recording device. Look directly into the camera. If you spend an entire video looking down at a script it will be obvious, and your videos will lose that professional flair. I can't tell you how many videos my newspaper classes recorded with the students looking down at their page and never once looking up. Your audience wants to see your eyes. It should feel like you are talking directly to them.

One way to help with this is to tape your script as close to the camera as possible. That way if you have to look at it from time to time, it isn't obvious. It looks more natural. I'd also recommend writing a bulleted list instead of a word-for-word script. You can start with a script, but eventually whittle it down to a few points. This helps the dialogue to flow more naturally and keeps you from sounding like a robot. (Unless you are recording a robot video, in which case, carry on.)

7. Record in a location with the best sound options.

The difference between a good video and a great one is often determined by sound quality, which go wrong in so many ways. The first thing to think about is your location and background noise. If you are recording with the built-in microphone on your recording device, record in a quiet room. Even with a good

microphone, you should pay attention to the background noise. If you're not careful, you'll have a disruptive background noise after you're done recording, and you can't do much about it after that. Avoid recording outside if at all possible: wind is recording's worst nightmare, and even if there is very little wind, recording without getting a whooshing noise is extremely difficult.

8. Invite students to help record videos.

Students are the most creative people in the school, especially if you make it a place where they can safely take risks. They are fearless and come up with amazing ideas for videos. I love to bring students into any video I can. Every once in a while, a random student will appear in one of my announcement videos. Chances are that student happened to come into my room during my planning period to ask me a question or drop off something from the office. If I'm recording, I'll make that student a part of my video.

On one occasion, I had a student who wasn't interested in my class at all. He wasn't a fan of reading and didn't want to participate in the lessons. He was constantly trying to goof off or make noises to get others off track. One day after school, I was getting ready to record a video when I saw him wandering around in the halls. I pulled him into my room and asked if he would be my cameraman for the day. I didn't really need one—a tripod would have done just as well—but I knew this would be a great opportunity to connect. At the end of the video, I added a clip of him and a shout-out to my rock-star cameraman. The next day, when I showed the video to the class, he was stoked. He had so much pride in that video and wanted to show it off to everyone. After that, he wanted to help out more and started looking for ways to contribute in class. He became an active member of the classroom instead of a passive bystander. Rainbows and sunshine didn't instantly fall from the heavens—he still didn't like reading—but it was definitely a step in the right direction.

9. Record everywhere.

A haunted prison, the White House, Diagon Alley at Universal Studios: I have recorded videos for my students in all of these places. I constantly record videos anytime I go anywhere. Vacations, work trips, ghost hunts—any new place is a great opportunity. Most of the time it just takes five minutes to shoot a quick video. Sometimes I record random stock footage I may want to include in

a future video. Other times I record a quick history lesson. The new locations provide a nice change of pace for the students.

These videos can add relevance to class by showcasing real places students are learning about or giving real context to content. Language arts teachers can share videos of places where novels take place. Social studies teachers can record at famous battlefields or historical landmarks. Science teachers can take videos where famous inventions were created. Students get a visual cue for content they may only see pictures of or read about. Sometimes what students read is disconnected from the real world, and this strategy brings the two together.

10. Do it.

The biggest thing holding most people back is fear. Fear that the video won't be perfect. Fear that you won't know how to record a video. Fear that your ideas are dumb. Fear that the students won't connect with the videos. And you know what? You're right. All of those things could happen. But guess what happens if they do?

Life. Goes. On. On those rare occasions when a video doesn't quite work out, you move on.

BUT…

For every video that doesn't work out, there are twenty more that get the kids fired up for learning and engage them in new and exciting ways. That makes it worth it. The value added to the classroom has so much more impact than a video that messes up. Failure is just a learning opportunity.

So, dive in and bring the Awesome Sauce to your classroom!

TECHNOLOGY *101*

Just about any video in this book can be completed with the most basic set-up. However, as you create more videos, you may want to expand the tools you use to record. Here are some things to consider:

1. **You need a solid surface to record on:** It is almost impossible to hold a camera still while you record. As I said in the Top 10 list, it's best if you

have a tripod, but if you don't, at least find a solid surface to set the camera on. I almost always find some way to set the camera down when I'm filming. It could be as simple as a table or shelf. When I record my announcement videos, I prop up my phone on the handles of a cabinet in my room because it happens to be the perfect height. Over the years I've accumulated more tools. You may want the following:

- A tripod that will hold your device on a table for videos where you want to sit and record talking directly to the camera

- A tripod that will hold your device at a height of 50" to 70" for videos where you want to more in the shot or for standing videos

- A selfie stick for adding unique angles in your videos

2. **You need some way to hit record:** Since you won't be holding the camera, you need a way to push record on your device. For some videos, I don't mind if the viewer sees me lean forward and push record. But if I want a video to look more professional, I have a clicker to push record or I edit out the first few seconds of the video. Most tripods come with a clicker that connects to your device through Bluetooth.

3. **You need some way to capture the sound:** Audio can make the difference between an effective video and one that distracts from the learning. The built-in audio on most devices works just fine when you are starting out, but eventually you may also want the following:

- A condenser microphone that connects to your device

- A lavalier microphone (one that clips to your clothing) that connects to your device

Whichever microphone you go with, make sure it connects to your device. For example, when Apple stopped including a headphone jack on the iPhone, I had to get an adapter for my lavalier microphone.

4. **You need to create the best lighting:** Lighting can be tricky, especially in a school setting. Fluorescent lighting can be dull. You need to make sure there aren't any bright glares on the camera screen. I've been able to get by just fine by recording during the day when possible and making sure to adjust the blinds to allow as much natural light in as I can. When I don't have

natural light, I use a lot of lamps to get the lighting just right. However, you might eventually want to invest in a photography lighting kit.

5. **You need some way to edit your more elaborate videos:** You may want to go all out and edit together an Awesome Sauce video. To do that, you'll need some way to edit the video together. Many devices have built-in editing software. For example, Apple products come with iMovie. Eventually you might want to invest in video-editing software.

6. **You may want to screencast (record your screen):** To screencast, you will need a couple of things: a camera to record video, a microphone to record audio, and an app, website, or software to record the screen. Eventually you may also want a web camera and camera to record the screen (most video-editing software includes a screencasting option).

When I first started recording videos for the classroom, I used my phone and iMovie. That's it! I didn't have any fancy equipment, and the videos turned out great. Each year I add one or two pieces to my collection through grants, gifts from my family, and conferences. Start small and do what you can with what you've got. It's not what you're recording with that matters. It's the Awesome Sauce you add to each video that truly makes a difference.

To get started check out the Awesome Sauce 101 playlist on YouTube: youtube.com/playlist?list=PLifJz8mRJxI3dCFS0jOCbR0e3JE2US094

CLOSING

THE GAP

*Digital Equity Strategies
for the K-12 Classroom*

SARAH THOMAS, NICOL R. HOWARD, REGINA SCHAFFER

The following excerpt is from this book.
Check out the complete book at iste.org/EquityK12

Chapter 2
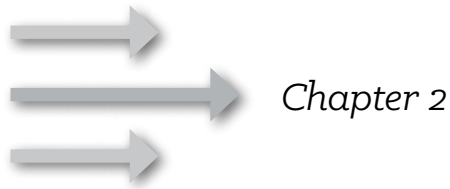
HOW MIGHT TEACHERS RESPOND TO THE CHALLENGES?

I'm not excited about a world where students just use technology to click through materials on a screen. But I'm very excited about a world where learners use technology to design, create, explore and engage with their peers around the world. This use of technology is incredibly powerful, and it's an opportunity that should be available to everyone.

> —Culatta, as quoted in Cortez, 2017

Although a large part of digital equity is access to devices and adequate bandwidth, as we saw in the previous chapter, it is not enough to simply buy devices and pre-packaged programs (such as the "drill-and-kill"). Forcing shiny new technology tools into adoption while the learning and purpose for the integration of the new tool lags behind is no longer an acceptable practice.

Excerpted from Chapter 2, "How Might Teachers Respond to the Challenges?"

Many of us have heard these edtech urban legends, where schools invest tens of thousands of dollars in new devices and programs while leaving the most important part of the equation unsolved: the human factor.

Before rolling out new technology on a large scale, educators must know what to do with it and why the tool was adopted for use. As we mentioned in Chapter 1, the last phase of addressing your digital equity problem of practice is planning for teaching and learning. Proper planning includes professional learning on such topics as tool selection, digital citizenship, student-centered design, facilitation, and more; all of which are all supported by the ISTE Standards for Educators (International Society for Technology in Education [ISTE], 2017).

The ISTE Standards for Students (International Society for Technology in Education [ISTE], 2016) help prepare students for an unknown future, by addressing skills that are gaining importance over time. Shortly, we will discuss this more, but first we'd like to draw attention to the skills we are preparing students to acquire for the future. A good illustration of these, and how they've changed over the decades, can be see in Figure 2.1, which was shared by California educators Adam Juarez and Katherine Goyette in a 2018 presentation at CUE Nevada. As the baby boomers were entering the workforce in 1970, more academic subject-heavy topics were at the top of the list, such as reading, writing, and arithmetic. Nearly fifty years later, however, we see that soft skills have risen as millennials are coming of age. Soft skills will likely continue to play a role in the future workforce, although they often play second fiddle to the core content.

The key approach is to integrate these soft skills seamlessly within the content, as supported by the Standards for Students (ISTE, 2016). Doing so supports learning for all students regardless of learning styles and/or abilities. We are reminded of the work of an ISTE Digital Equity Network Leader, Valerie Lewis,

Excerpted from Chapter 2, "How Might Teachers Respond to the Challenges?"

who is currently an assistant principal in Georgia. She recently shared her story with us about the integration of technology in special education (see the sidebar, "Technology in the High School Special Education Setting"). Valerie recognizes that students in special education classrooms are often overlooked, so her refreshing perspective is one we hope you will benefit from hearing.

Figure 2.1 Compare the *Fortune 500* list of Most Valued Skills in 1970 and today. *(Image credit: Juarez & Goyette, 2018.)*

➡️ *Educator Voices*

Technology in the High School Special Education Setting

by Valerie Lewis, Assistant Principal

Learning in and of itself is difficult—not to mention when you are a student diagnosed with learning deficits or more simply, in need of some supports and accommodations.

According to the National Assessment of Educational Progress 12th grade report, 5% of students with disabilities scored at Proficient or beyond in 2011 (Figure 2.2). This

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certainly does not help our case when pacing guides already send teachers into overdrive. So how does a teacher work around time constraints? What does effective instruction, assessment, and timely feedback look like for students with learning disabilities? After many years in a resource setting, I knew that I had to leverage technology in my classroom, specifically through the effective use of free applications that would complement my classroom instruction.

After you establish your goal, consider how to find the tools that will help you achieve it. Too often people decide that tech is good enough to use without a clear plan. It must serve a purpose. You want to get meaningful work done and not just busy work complete. Every assessment shouldn't just be on paper and pencil—or on a computer. Tech allows students to show what they know in a variety of ways, but more so—it allows access to things and places that may otherwise be considered a stretch. Isn't that what teaching and learning is all about?
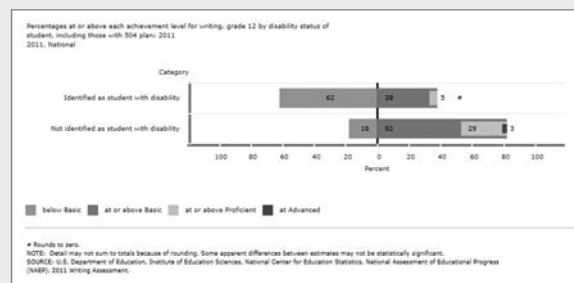
Figure 2.2 Fewer students with disabilities scored at Proficient or beyond *(Image credit: U.S. Dept. of Education, 2011.)*

Writing
For example, writing can be frustrating for students with disabilities because of motor dexterity challenges or because

Excerpted from Chapter 2, "How Might Teachers Respond to the Challenges?"

articulating their thoughts through written communication is more difficult. Unfortunately, the curriculum and pacing guides do not often build in the time needed for teachers to model or practice writing. It is still very important for students to write and to recognize writing as not only a form of communication, but also as an important building block to help them develop the necessary skills (e.g., soft skills, motor skills) that will be beneficial beyond writing.

To help students, I integrated Google G Suite (especially Google Docs) into lessons. This tool allowed my students to pull up information and share documents that I could view and edit it in real-time. Chunking students' work or putting it into manageable parts is helpful and perhaps part of the supports or accommodations written in their Individualized Education Plan (IEP). By using Google Docs, my students and I and could easily work on a long essay in chunks, editing them as they were written. This approach not only eliminates the long wait for feedback, but also avoids student frustration and the letdown of having to redo everything after writing a long essay. Both my students and I could gain insight on what they are doing well and what changes would improve their work, as they went along. In the comments section, I could quickly give feedback on capitalization, grammar, sentence structure, word choice or even citing supporting evidence in a research paper. Students would become less anxious when they felt like they were getting individual support along the way and arriving at the end was a whole lot less daunting.

Teaching grammar in isolation is almost a thing of the past. Some teachers find ways to carve out time at the start of class (bell ringer) to complete Daily Grammar Practice (DGP) exercises. Although that approach helps to set a foundation of understanding, some find a less intimidating way to teach this skill through the Grammarly browser

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extension (grammarly.com). Available for the Chrome, Edge, Firefox, and Safari browsers, this free tool is essentially a writing assistant that helps to spell check, define words, find synonyms, and make timely suggestions while you write. When students are writing, suggestions become visible and they can easily self-correct and then begin to recognize mistakes they often make. You can also have follow-up in conversations with them about their writing ethic and encourage them to goal set and build.

Speaking and Listening

Very rarely do you come across a teen that doesn't have an opinion of his or her own. Under the right context, you just may have a hard time getting them to sit still and quiet. This is where student choice comes in: Topics for discussion (school appropriate, of course) should sometimes come from the students. If they are interested in it, then chances are they are willing to engage and participate. This is half the battle. Too many times, we are dead set on checking off a list of our "must-dos" that we fail to meet the needs of our most important treasure—the students. Find ways in which to connect the units of study, themes, or topics to things that kids like. They may actually retain the understanding much better. Get creative on how you connect standards and skills.

In this age of tech, I don't spend time collecting phones and holding them hostage at the board or behind the door. Instead, I find ways to engage kids with the tech glued to the palm of their hands or other devices they brought to school with them. Through Snapchat, we build Snap Stories, which were reflective of their learning, as well as build #BookSnaps (tarammartin.com/booksnaps-snapping-for-learning).

To tie in the writing component, I also give students the opportunity to pick an area of interest to blog about through

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Blogger; being a G Suite for Education school makes this easy. I found my students became most excited when they could get feedback from their peers within the class and those across district, state, and country lines—or out of the country. To push a step further, students also have had the experience of creating their own podcast show using Audacity (sourceforge.net/projects/audacity). Creating intro music, show notes, and a storyboard, as well as researching for evidence that supports their commentary, allows students to use multiple skills across platforms in an authentic way. Just wait until you see what content they can produce! Of course, these are additional ways to assess learning, understanding, or applying the skills you want to see in context.

Reading

Everything circles back to literacy, which is true across all subject areas. Students' Lexile levels are informative on how they can access and understand text. Websites like lexile.com will allow struggling readers more accessibility to information. Do not take for granted the idea that student choice in reading is key. If a student wants to pick up a book and develops a love in that manner, we should celebrate that daily. CommonLit (commonlit.org), Newsela (newsela.com), ReadTheory (readtheory.org), and other online content platforms can assist you in pairing nonfiction, poetry, and current events texts with instruction and standards. I most appreciate that these sites have assessment tools that show student progress in an easy-to-understand manner. This data is shareable with parents and makes having conversations during parent-teacher conferences easier. Working with your media specialists and having them label books, or sections of the library, by Lexile levels is helpful, as well. All of this will help you move the needle towards higher student achievement, while also enabling

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you to embed such strategies as SOAPStone (speaker, occasion, audience, purpose, subject, tone), RACE (restate the question, answer the question, cite the source, and explain), OPTIC (overview, parts, title, interrelationships, conclusion), and annotating to help students increase meaning and understanding when interacting with text.

Give It a Try
Although this may seem like a lot of suggestions, remember that the new ideas you try will be seamless with practice and time. Find one or two tools to focus on and add to your practice; see how they help inform your understanding of your students' learning and mastery of skills. It is important to continue to grow as an educator and improve your effectiveness through professional knowledge, instruction, communication, assessment uses, and academic rigor. Use tech to leverage what you are doing, but always be clear it will not solve the education gap exclusively.

ISTE Standards

While leveraging technology for learning, be mindful of the role the ISTE Standards can play. They are aspirational, meaning that they are where we would like every student, educator, coach, and administrator to aim as goals on their learning journeys. As for other standards, and even models of technology integration such as SAMR (substitution, augmentation, modification, redefinition) and TPACK (technological pedagogical content knowledge), the point is that our learners should have the capacity to reach these benchmarks, even if they are not evident in every single lesson. Our end goal is certainly an application and a mastery of the ISTE Standards for Students, which can be facilitated

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by a mastery of the Standards for Educators and Standards for Coaches (ISTE, 2011).

ISTE Standards for Students

The ISTE Standards for Students were first established in 1998, with a focus on learning to use technology. The second iteration in 2007 shifted the lens to using technology for learning. Although not explicitly stated, the ISTE Standards address the digital equity challenges students face today especially through the current version of the Standards, which are centered on transformative learning with technology. The seven standards, shown in Figure 2.3, support the philosophy that

> Today's students must be prepared to thrive in a constantly evolving technological landscape. The ISTE Standards for Students are designed to empower student voice and ensure that learning is a student-driven process. (ISTE, 2016)
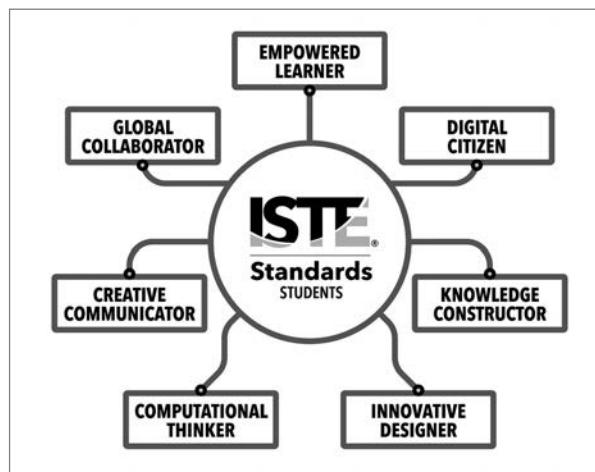
Figure 2.3 Prepare today's students to thrive in an evolving technological landscape.

Excerpted from Chapter 2, "How Might Teachers Respond to the Challenges?"

One of our authors, Sarah, was a member of a 2017 ISTE Technical Working Group, and recalls the conversation around developing the Educator Standards in the context of the Student Standards. These two sets of standards interplay to transform learning to prepare students for their future, as well as the present day. By nature of the Standards for Educators and for Students, educators have a common benchmark against which to measure their own progress and that of their students, which promotes digital equity for all.

ISTE Standards for Educators

Another of our authors, Nicol, participated in rounds of evaluations during the ISTE Standards for Educators refresh. Students in her masters in education course engaged in rounds of discussion about how each of the seven ISTE Standards for Educators (Figure 2.4) serves to enhance digital equity in some way. The goal of the Standards themselves is to provide transformational learning opportunities for each student around the world. Arguably, any efforts toward building educator efficacy contribute to solving inequities as they help to enhance learning opportunities for students. As ISTE stated,

> The ISTE Standards for Educators are your road map to helping students become empowered learners. These standards will deepen your practice, promote collaboration with peers, challenge you to rethink traditional approaches and prepare students to drive their own learning. (ISTE, 2017)

We will discuss the ISTE Standards for Coaches later in Chapter 3; for now, let's take a closer look at certain themes that emerged from all of the Standards. These three themes promote digital equity; interestingly (and perhaps subconsciously), the themes emerged in the following order: lifelong learning, communication, and transforming learning.

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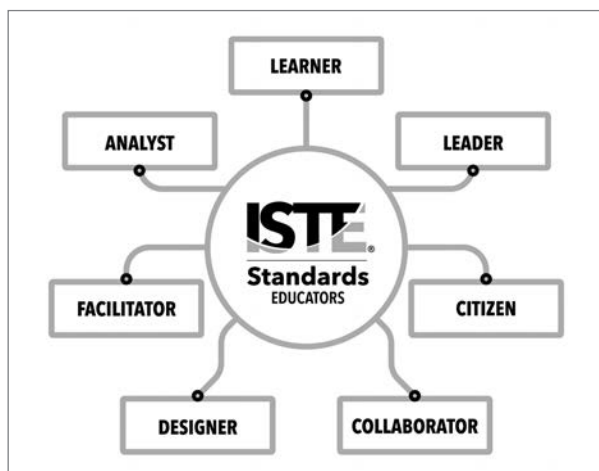
Figure 2.4 The ISTE Standards are an educator's road map for preparing today's students.

Lifelong Learning

Essentially, the goal of the first ISTE Standard for Educators, Learner, is to promote self-directed lifelong learning in order for learners to increase their capacity to deliver high-quality, transformational learning opportunities (ISTE, 2017). Much like the Empowered Learner from the Student Standards, educators are expected to set their own goals for learning, using the power of technology to enhance the experience (ISTE, 2016).

Think back to how you first became connected in your journey to professional learning. What was the spark? For many of us, it was through traditional face-to-face environments. A little over a decade ago, before the rise of social media, options for professional growth were limited, and educators were often at the mercy of whatever offerings were mandated to them. If they wanted choice over their learning to best support their students, their sole option was to connect during district professional development (PD) days or conferences.

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Many conferences have a registration fee, therefore unless the school or district is willing to pay (and approve professional leave), this may present a barrier. As Sarah Thomas wrote,

> Creativity in schools should not be limited to the more affluent districts. All learners deserve high-quality teachers, who are motivated to grow professionally for the good of their students. (Thomas, 2017)

Additionally, such face-to-face events are usually held infrequently, and once sessions are over, attendees may not have support as they implement their new learning. However, we have come a long way in a very short time as we detailed in Chapters 2 and 3 of *Closing the Gap: Digital Equity Strategies for Teacher Prep Programs*, and now educators have a variety of options available.

Self-Directed Professional Learning

According to Dr. Randall Sampson, "Self-directed professional learning is what teachers want and need. Through self-directed professional development, teachers will be able to seamlessly reflect, align and implement best-practices; personalized growth is created and implemented by each teacher" (Sampson, 2015). Here are just a few ideas for teachers to take control of their professional learning journeys:

> **Twitter chats.** Twitter chats are "usually moderated and focused around a general topic. To filter all the chatter on Twitter into a single conversation a hashtag is used. A set time is also established so that the moderator…is available to engage in the conversation" (Cooper, 2013). These chats have proved invaluable to many educators around the world, and allow for multiple perspectives to be shared in a limited period of time. Furthermore, the conversation is then publicly archived on the hashtag itself. *You can find a list of Twitter chats at cybraryman.com/chats.html (Blumengarten, Hamilton, Murray, Evans, & Rochelle, n.d.).*

Excerpted from Chapter 2, "How Might Teachers Respond to the Challenges?"

Voxer Groups. Voxer is what we call a freemium (free for the basics or pay for the premium) walkie-talkie application available on the web, iOS, and Android platforms. It allows large groups of up to 500 members to discuss topics and listen back asynchronously, facilitating global communication. *Although Voxer does not have the searchability of Twitter chats, you can find a crowdsourced list of groups at theedsquad.org/voxer (Corbell, Gauck, Pacheco, & Thomas, n.d.).*

Edcamps. Edcamp is a movement that began in 2010, which has expanded exponentially and globally. In essence, these events are spaces where educators come together for peer-to-peer learning. There are no presentations, only facilitated informal conversations; in fact, the daily schedule is decided by participants on the day of the event. While Edcamps are primarily based on geography, some online virtual Edcamps have emerged on platforms such as MIT Unhangout (unhangout.media.mit.edu) and even Voxer. *To find out more about Edcamp, please visit edcamp.org. For examples of virtual Edcamps, take a look at edcampedumatch.org and edcampvoice.com.*

Several other options exist on spaces such as Facebook, LinkedIn, YouTube, podcasting, and more. For anyone seeking to grow professionally, you have quite a selection!

Traditional PD Provides Benefits

Conferences and face-to-face meetups have benefits that the online world cannot replicate (and vice versa), and for many educators, they are an entry point into learning about more of the free and virtual options that can take their pedagogy to the next level. As the old saying goes, "you don't know what you don't know," and many of us have received our first exposure to the connected world by attending a conference.

According to research conducted Project Tomorrow (2018), conferences are still the second-most popular option for

Excerpted from Chapter 2, "How Might Teachers Respond to the Challenges?"

self-directed learning with 40% of respondents having reported being an attendee. This slightly trails watching videos online (46%) and is far more popular than social networking (33%) or engaging on Twitter (23%). Also apparent in Project Tomorrow's results is the rise in popularity of online self-directed learning, showing an increase in usage of social media since 2010. However, not a single category reported had adoption rates by the majority of respondents. Thus, although we have come a long way as a profession, we still have room to grow.

Communication

The second emergent theme from the Standards for Educators is that of communication. While the Standards for Students note the role of "Creative Communicator" (ISTE, 2016), there is no similarly worded standard in the Educator Standards. Instead, we see this theme referenced in standards such as Leader, Citizen, and Collaborator (ISTE, 2017). As Sarah Thomas explained,

> Many of the new Standards focus on transparency, with the aspiration of partnering with parents and community members. There is also an increased focus in acknowledging the voices of the most important stakeholders of all, the learners themselves. (Thomas, 2017)

The Leader standard is unique in two ways: It is not mirrored in the Standards for Students, and it is the only one that explicitly mentions equity, stating "advocate for equitable access to educational technology, digital content and learning opportunities to meet the diverse needs of all students" (Indicator B). However, as mentioned before, the Standards as a whole help support equity by providing a universal set of standards for educators to cultivate deep and active learning. Furthermore, the theme of equity is also heavily implied in Indicator A, "empowered learning with technology by engaging with education stakeholders," which

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suggests advocating for transformative learning experiences. This implication continues in Indicator C, "Model for colleagues the identification, exploration, evaluation, curation and adoption of new digital resources and tools for learning" (ISTE, 2017).

The Citizen standard (mirrored in the student standards as Digital Citizen) continues to gain importance, as it is easier than ever before to connect with other educators, schools, and stakeholders globally through social media. As Julia Freeland Fisher, director of education research at the Clayton Christensen Institute, pointed out,

> Social capital scholars have long pointed to the fact that opportunity flows through individuals' networks. In fact, according to some estimates, nearly 50 percent of jobs come through personal connections. In some cases, these come through strong ties, but they can also come through looser connections—what researchers call "weak ties"—which tend to offer up new information not necessarily contained in stronger-tie networks. (2018b)

The Organization for Economic Cooperation and Development (OECD) defines social capital as "networks together with shared norms, values and understandings that facilitate co-operation within or among groups," (Keeley, 2007, p. 103). OECD further delineates it into three categories:

> **Bonds:** "links to…'people like us'… such as *family, close friends and people who share our culture or ethnicity*" (italics added for emphasis)
>
> **Bridges:** "links that stretch beyond a shared sense of identity"
>
> **Linkages:** "links to people or groups further up or lower down the social ladder" (Keeley, 2007, p. 103)

Excerpted from Chapter 2, "How Might Teachers Respond to the Challenges?"

All students bring to the table with them some form of social capital; however, not all capital is held in equal regard in the eyes of society, as demonstrated by injustice, discrimination, and bias.

Some students might be fortunate to access bonds that will provide them with advantages established through family connections, culture, or even ethnicity. Other students who are members of groups that have been traditionally marginalized often find themselves pushed further to the sidelines. Through the power of social media, however, individuals are now beginning to disrupt this perpetual system of inequity. As Julia Freeland Fisher (2018a) argued, schools are in position to assist students in creating inclusive networks through bridges: "Schools looking to prepare students for the workforce and open doors for their students are pursuing models designed around the critical role that social capital plays in expanding access to opportunity." Likewise, schools can help prepare students through emerging technology platforms that cultivate relationships, both on and offline. To address this need, the Institute has created whoyouknow.org, which helps pair students "with coaches, experts, mentors, and peers—otherwise out of reach" (Christensen Institute, n.d.).

In an interview with Getting Smart (Ryerse & Berkeley, 2018), Fisher stated that schools can also help students access these bridge connections in the following ways:

- Focus on the network of care.

- See the school system in terms of "slots" in which a student can learn.

- Incorporate project-based learning.

- Expand students' access through advisory systems.

- Explore opportunities for change in school design.

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Creative Communicators Transforming the World

Not only are educators in position to help students build networks—they can also support them in transforming the world. In Chapter 3 of *Closing the Gap: Digital Equity Strategies for Teacher Prep Programs*, we discussed how social media has played a significant role in today's society, as well as how it has impacted digital equity in that youth (and others) are now using various platforms, such as Twitter and YouTube, to advocate for themselves and organize at grassroots levels. We touched upon how movements that utilize hashtags have gained momentum through social networks. Another example of students using social media to positively impact the world is that of students at Marjory Stoneman Douglas High School in Parkland, Florida, who, after the shooting at their school, leveraged the power of social media to launch the Never Again movement and fight for change to prevent school shootings. As Sarah Stoeckl eloquently stated,

> When advocates of education technology talk about the ISTE Standards and digital tools used to change teaching and learning, we often give examples built within traditional subject areas and focused on feel-good activities by students. The "Never Again" students exhibit the ISTE Standards for Students in action, but in a way that reminds us we are not only preparing students for academic or career achievement, but also for life in a complicated, messy, often brutal world. (2018)

As more and more students begin to leverage social media for advocacy, educators must be prepared to support them in their acquisition of knowledge around digital citizenship without eliminating the platforms that allow students' voices to be heard (Howard, 2015). We view digital citizenship as a key component in the pursuit of digital equity. Promoting looking beyond traditional definitions of digital citizenship, where emphasis is placed on safety, and instead encouraging educators to look into more meaningful implications, Marie K. Heath stated,

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The findings and discussion of this question suggest that uncritical usage of the term *digital citizenship* limits citizenship development in schools. Further, it hampers practitioners and scholars from imagining opportunities to use educational technology to develop pedagogies of engaged citizenship for social justice. These gaps lead to the fair critique of educational technology that technologists offer platitudes that technology can address issues of equity, but technologists have yet to develop strong pedagogies of liberation that leverage affordances of technology. (Heath, 2018, p. 5)

In her 2018 article, Heath identified three models of digital citizenship: *personally responsible citizen*, focusing on responsibility and character; *participatory citizen*, addressing organizing for social change; and *justice-oriented citizen*, using social media to "use technology to help interrogate established and oppressive norms" (p. 5). One key point identified regarding her study of justice-oriented citizenship models is that "several articles made general nods toward global citizenship or equity, often conflating access and equity or displaying a paternalistic and colonial attitude toward global citizenship" (p. 11), a sentiment echoed by Thomas (2018), who noted "... we tend to see a common theme: someone centering him/herself as the hero and saving the day, regardless of whether their 'saving' is welcomed and solicited, or not." This is an important, yet often overlooked, aspect to both digital citizenship and equity, as global communication and interaction is more available than ever before. We, as educators, need to model and embrace the entire continuum of digital citizenship in order to help our students navigate virtual spaces.

Digital Citizenship Resources

The need for good digital citizenship continues to grow as we move more of our interaction online. Furthermore, Howard (2015) said "as students grow older, they spend more time using

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digital devices and online networks. The use of these tools opens lines of communication globally, so now is the time more than ever to support our students." The following resources offer a few ways that you and your students can learn with the world.

> **DigCit Institute, DigCit Summit, DigCit Kids.** "The Digital Citizenship Institute is an inclusive innovation network promoting a positive digital citizenship message of social good…[and provides] a community-driven approach to educating and empowering digital citizens to create solutions in local, global and digital communities" (DigCit Institute, n.d.). Founded and run by Dr. Marialice Curran, the DigCit Institute holds conferences around the world to help educate stakeholders on this crucial topic. Additionally, Dr. Curran's son, Curran Dee, is the Chief Kid Officer of DigCit Kids, which features "kids solving real problems in local, global & digital communities" (DigCit Kids, n.d.). *Find them at digcitinstitute.com, digcitinstitute.com/digcitsummit, and digcitkids.com.*

> **Our Global Classroom.** Established by Bronwyn Joyce, Our Global Classroom is a "space to share ideas and thoughts with your learning community" using the FlipGrid platform. At the time of this writing, there have been over 200,000 views and 13,000 responses to various prompts from students around the world about real-world problems. Talk about authentic learning! *Find this project at flipgrid.com/whatif, using password "whatif."*

> **EduMatch.** Founded by one of the authors in 2014, EduMatch is a global community of educators connecting and learning together, using various forms of social media. The organization has a global reach of over 30,000 educators, who come together on platforms such as Twitter, Voxer, Instagram, and others to discuss educational topics. EduMatch also hosts a podcast, which was featured by ISTE as one of the top

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podcasts of 2017; publishes crowdsourced and solo books; and, at the time of this writing, is preparing to launch a nonprofit arm to support grassroots projects of educators and students. *Find them at edumatch.org.*

Communication and Collaboration

Digital equity and digital citizenship go hand in hand. Students are increasingly utilizing their online networks, and as Collaborators, educators can use the power of their own networks to provide high-quality authentic learning experiences, to prepare students for an increasingly global world (ISTE Standards for Educators, 4: Collaborator, 2017). A key component of the Collaborator standard (paralleled in the Student Standards as Global Collaborator) focuses on transparency; engaging all stakeholders in the learning process. Collaboration as a form of communication tends to be overlooked, however, Collaborator calls it to the forefront. Within the standard, educators must communicate with colleagues, students, community members, and parents. Notably, Indicator D under the Collaborator standard speaks to the need to "demonstrate cultural competency when communicating with students, parents and colleagues and interact with them as co-collaborators in student learning." This brings to mind the notion of *culturally relevant*, *responsive*, and *sustaining* pedagogies, as explained in our first book (Howard et al., 2018). Digital equity cannot be separated from culturally relevant pedagogies. Doug Havard, a STEM Teacher on Special Assignment (TOSA) and Physics/Robotics Instructor from Southern California, agrees and recognizes the importance of building a social culture that is human-centered, rigorous, and includes place-based learning experiences for all students in the midst of digital equity challenges. He shares his thoughts in the "Culturally Responsive Computing" sidebar.

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Educator Voices

Culturally Responsive Computing

By Doug Havard, STEM TOSA and Physics/Robotics Instructor

Not so long ago, pedagogical approaches to teaching and learning in our educational system were deeply contextualized by local living conditions and educative experiences: dominated by the interrelationships between the home, school, and community. Incongruencies on the means and ends of education, largely dominated by historical narratives and technological advancements throughout the mid-20th century, have led the school to become more institutionalized today (Greenwood, 2011). Along the way, accountability measures and standards-based teaching methods have attempted to stratify the educational ethos, a departure from the early form of education centered on experience (Spring, 2018). As a result of these standard-based approaches and the changing social and cultural nature of the American school, the emergent form of education over the last decade has led to a widening of the digital divide (van Dijk & Hacker, 2003). Contemporary research has revealed significant gaps in access, use, support networks, and skill in technoliteracies, particularly within underrepresented populations of students (Kahn & Kellner, 2005; Warschauer, Knobel, & Stone, 2004). In response to these philosophical stances, educational researchers have sought ways of bridging the access gap through *culturally responsive computing* (CRC) practices (Lachney, 2017; Lee, 2017; Scott, Sheridan, & Clark, 2015) and *place-based education* (Greenwood, 2011; Gruenewald, 2014) as counter-narrative pedagogical approaches which promote inclusion, digital equity, and self-efficacy.

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Applying these perspectives, Scott and White (2013) sought to understand how unique STEM learning contexts employing CRC practices affected girls' pre- and post- programmatic engagement. Their research study, conducted on a sample of forty-one high school students participating in COMPUGIRLS, a National Science Foundation–sponsored program teaching technoliteracies to girls in digital media, game development, and virtual worlds, contended that girls are interested in technological fields despite a lack of culturally relevant opportunities to pursue such disciplines. They discovered the more complicated the technology and the higher the expectations, the more COMPUGIRLS participants expressed enjoyment. Moreover, Scott and White (2013) observed that the power of manipulation (e.g., to design and build an artifact that performs a task) not only intrigued participants, but also empowered them to perform individual research on specific technological topics in innovative ways—encouraging social change. This example of spiraling back to a time of connecting students, technology, and the world through educative experiences proposes an opportunity for reconnection between the means and ends of education today and our role as teacher educators.

My experiences as a K–12 STEM educator, STEM TOSA, and STEM program developer within a public high school have revealed the value and importance of building a social-culture that is human-centered, rigorous, place-based (has a positive role in the community), and connective to the discrete, individual experiences of students. These foci are not only reflected in the research presented above but emerged out of a number of experiences with my students while building a STEM-based program, namely through rigorous competition (e.g., US FIRST Robotics, NASA Student Launch, and Lemelson-MIT InvenTeam), but also through student-designed opportunities (TeenHacks Hackathon)

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and curricular endeavors (mechatronics colloquia) centered around instilling inventive practices through an interdisciplinary, human-centered engineering curriculum. The unstated challenge facing STEM educators in the K–12 setting is how to provide CRC experiences to students that afford access to computers with the ability to run industry-level software, an institutional knowledge base and practices to access technical content, financial support to enter into competitions and sustain future entries, and an equitable CRC curriculum to strengthen positive interactions between students' lives and technology. By maintaining a program focus on building community leaders, my colleagues and I centered our work around a methodology seeking to directly support and involve the community. The return on this place-based educational approach was a spiraling up of interconnected factors including opportunities for students to engage in solving problems in their community, technical experts reaching out in support of building an institutional knowledge-base, in-kind financial and material support from local industry, and a rise in program participation of our underrepresented female student population.

Matching curricular experiences which are culturally responsive and rigorous with community problem-solving has the opportunity to empower a generation of fledgling underrepresented scientists, technologists, engineers, and mathematicians. Although building social culture within your school and community can be initially slow, and often arduous, the power it places in the hands of students is transformative. Place-based educational practices which bridge the school and community will yield more real-world, problem-solving opportunities for students, access to digital resources, and supports for running difficult to maintain, albeit influential and inspiring, competitions such as US FIRST Robotics.

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Integrating Technology in the Classroom

Second Edition

Tools to Meet the Needs of Every Student

Boni Hamilton

The following excerpt is from this book.
Check out the complete book at iste.org/IntegratingTech2E
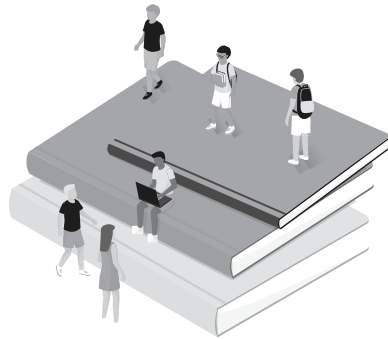
CHAPTER 11

Leveraging Technology for Teacher Efficiency and Effectiveness

CAN YOU IMAGINE having a teaching partner or assistant who could generate exciting ideas for lessons, help deliver instruction, reinforce students' classroom experiences, engage students in higher-level thinking, assess students' thinking skills, and support your professional growth? Such a paragon would be welcome anywhere, right? Yet, an excellent teacher's helper capable of all this assistance sits on your desk—your computer.

In the previous chapters, the tools listed have generally been for student use with teacher support. This chapter focuses on teachers' needs. Two types of resources are covered: teacher tools that provide efficiency in instruction, and professional development resources that promote effectiveness in instruction.

Before conducting in-school research, I would have considered the use of technology for efficiency undesirable. I now recognize that efficiency is, and should be, one outcome of increasing technology use in classrooms. The opportunity to use digital tools to efficiently manage administrative tasks frees teachers to devote more time to working directly with students.

However, always using digital tools for efficiency harms students. When all student work is submitted online, graded online, and returned with feedback online, the relationships between teachers and students become more impersonal. Students crave positive connections with adults they admire. Think about the casual conversations that occur when teachers are distributing and collecting student work. Students don't just talk about the academic work; they share funny stories or recent successes or insights from their reading. For some students, those in-the-moment connections may represent their best conversations of the day.

Social Platforms

Some teachers, particularly at the secondary level, use social platforms with their students. In fact, some of the tools listed in previous chapters have had social media aspects teachers can leverage with their students. Social media can be an excellent tool for efficiency as well.

Unless a social platform has a protected area for students, use of the platforms in classrooms is constrained to students age 13 or older. The platforms are appropriate for teachers to connect with parents and other teachers.

Because so many social platforms are part of the common experience in the United States, rather than linking individual platforms, I will present resources and ideas for harnessing their power for educational purposes. As recent developments with breached security have demonstrated, teachers should be aware that privacy in social media platforms is not guaranteed and a misstep can lead to dismissal. Be judicious in what you post and how you respond to others.

VOICES OF EXPERIENCE

Nicole M. Zumpano, NBCT, Technology Coach

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Using Twitter to Build Community

As a technology coach, one way I promote the positive use of social media in my school is through Twitter projects. While we highlight great things all year long, I am always pleased at how we are able to build community at the beginning and the end of each school year using Twitter.

Setting the Tone

In Chicago we start school with our students the week of Labor Day, so our first week is always 4 days long. To build excitement for the new school year, each day I release a different Twitter prompt for our students and teachers to respond to. Past examples include: What are three things you love about Coonley? What are you looking forward to learning this year? What does your teacher need to know in order for you to be successful this year? What is one thing you learned this summer? Our teachers who already use Twitter respond directly to the prompt and tag us. Those who don't use the platform still contribute! Many will give students Post-it notes, use their whiteboards, index cards, etc., to respond to the prompt. The teachers will then snap a picture and send it to me to post for them. This not only allows our parents a sneak peek into our classrooms but also gives our teachers some talking points about responses they receive. Each year more teachers join Twitter to be a direct part of the action.

Laura Parsons @211Coonley · 30s
I guess my 5th graders are excited to learn more about math and science!! It's going to be a great year. #firstdayofschool @CoonleyES

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Wrapping Things Up

Since we begin school in September, we get out much later in June than other districts. June can be a long month! In late May I invite students to create six-word memoirs (See sixwordmemoirs.com/about/#story-of-six-words for an explanation) about their year in which they sum up events, give advice to incoming students, or share something positive about the school and their classroom. Teachers create one Google Slides presentation and give each student one slide to complete (they are able to design their own slide so long as they use their first name only). When classrooms have finished, I compile all of the presentations into one giant slideshow, usually more than 600 slides long, with six-word memoirs from kindergarten through eighth grade! To continue building community, each day in June I select three random six-word memoirs to tweet out. Many have witty captions that are added to build excitement. I schedule these ahead of time using **Hootsuite** (hootsuite.com) so I never forget to send one out and schedule them to be released at the same three times daily so parents and students know when to expect them. Our school community loves them! If you would like to see a finished product, view one of our slideshows here: tiny.cc/gvziwy

Follow Coonley School @CoonleyES and Nicole Zumpano @nmzumpano

• • •

Some schools have found social media to be a good way to communicate with parents and, possibly, older students. One teacher set up a Facebook account for her grade level, only to find it confused parents who had already been directed to both a school account and a parent organization account. Collaboration across the school consolidated all the separate accounts into one general account where a few key leaders could monitor what was posted. Investigate how parents are already being informed before adding a new social media account, whether that account is a school website, wiki, Twitter, Facebook, or Pinterest. Parents want one news outlet, if possible. Multiple logons and multiple places to look means some parents will miss the information altogether. Also, be conscious that not all parents have access to accounts, even if the application is free. Facebook (or Twitter or Pinterest, etc.) is not for everyone.

Pinterest has a special section just for educators called **Teachers on Pinterest** (pinterest.com/teachers). If you want ideas for using Pinterest well, look at **The Guide to Pinterest for Educators** (rossieronline.usc.edu/pinterest-for-educators) written by author Leah Anne Levy.

If you are using Twitter and want to follow specific Twitter chats, consider using **tchat** (tchat.io), a tool for filtering out just the chat you want to follow. Read a review of the site on **TeachersFirst** (teachersfirst.com/single.cfm?id=17107) to get ideas for how to use it effectively.

Fakebook (classtools.net/FB/home-page) is a protected way to provide a simulated Facebook environment for students (with parental permission). This would be a way to let students share their work with parents in an unusual format. TeachersFirst's review (teachersfirst.com/single.cfm?id=14197) of Fakebook highlights ideas to get you started.

Learning Management Systems

Learning management systems enable teachers to create classroom accounts, upload student accounts, and have one online place where students interact with one another, work collaboratively, take assessments, turn in assignments, and generally track their school lives. Rather than hosting a blog on one website, a wiki on another, and a discussion board on a third, many K–12 teachers have migrated to platforms where they can do it all in one space. This increases teacher and student efficiency.

Several K–12 learning management systems provide free teacher accounts or low-cost district or school accounts.

G Suite for Education (edu.google.com) has infiltrated many K–12 districts across the United States, particularly when schools have adopted Chromebooks as student devices. Google Classroom enables teachers to create classes, distribute assignments, provide feedback, and promote collaboration. Many digital tools being created online intentionally integrate with G Suite.

Edmodo (edmodo.com) has gained popularity among teachers, not only for the look and feel of social media, but also for the professional library and community it provides. Teachers can draw from a library of lessons and resources created by

other members of the learning system. Teachers can also easily arrange for their students to interact with other classes in the system.

Schoology (schoology.com) is similar to Edmodo, although each learning management system has its own personality. Schoology apparently has an excellent interface with iPads, which is a winning feature for some users. Schoology offers a free Basic package for individuals and a subscription-based platform for enterprise systems.

WeSchool (weschool.com/signup) works across all devices and promotes its capacity to blend any website, content, or tool (i.e., YouTube, Google Docs, Dropbox, Khan Academy, etc.) into a single experience. Assessments can include up to nine different question formats including video. Can be used with distance learning and flipped classrooms as well.

VOICES OF EXPERIENCE

Jennifer Bond, third-grade teacher

Glengary Elementary, Commerce Township, Michigan
edmodo.com/jenniferbond

I was first introduced to Edmodo in March of 2009 at Michigan's technology conference. Steve Dembo mentioned it quickly during one of his sessions, and I added it to my notes. A month later, I was preparing to share what I had learned at the conference for my staff, and I checked into Edmodo. I easily created a teacher account and created a group for my students. It was a Friday, and I signed all of my students up and sent them home with their usernames and passwords. Many students logged in and participated in discussions over the weekend, but the discussions went more like this, "Hello! Hi! Anyone there? Is anyone on Edmodo? I am at my house." "Me too! Hi Mikayla!" I regularly checked the group, and I tried to get the kids to understand this was not a chat room through posts, as I envisioned students staying glued to their computer screens waiting for someone to reply back. I was concerned what parents were thinking about this new platform. I realized that I had set them free on this site without giving them the tools and expectations for

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using it. On Monday when they returned, we created norms for using Edmodo, and I taught them the difference between a chat room and a social learning network.

More than 10 years later, I am still using Edmodo with my third graders, and our uses for Edmodo have come a long way since we started using it in 2009. My students still like to share things about their life outside of school, from links to fancy hairstyles for the Daddy/Daughter Dance or the news that their little sister swam through a hula hoop in swim class, yet we can use it to easily organize digital files and resources, use it for formative assessment, connect with other classrooms, shop for new resources, and more. I call it my digital classroom hub! I easily create quizzes that are automatically graded and put in the Edmodo gradebook, or assign Snapshots that are generated using common standards.

When we go into the lab, I often use Edmodo to organize our lab tasks. For example, we did an activity where we had to go virtual shopping for a Thanksgiving meal. I linked sale ads from four stores to a post and the children had to choose one where they would shop. Then they had to post a reply on how much their dinner cost. You can also offer **Ask Mo** (askmo.edmodo.com) to your curious students so they can learn facts in a fun way. In addition, I have embedded Google Maps and asked the children to post what natural and human features they found. Often I add sites or videos that help reinforce concepts we have studied in class. Yes, I can post the same sites on my webpage, but my webpage does not allow the interaction. Each Edmodo group I create is a constantly evolving community that allows all people involved to contribute!

Speaking of contributions and community, Edmodo has also evolved through the years to be an amazing site for connecting with teachers from around the world! In addition to the classes you create, there are groups you can join, as well as topics to follow, depending on your interests. Educators from all around the globe post resources, pose questions, and have conversations. Resources can easily be added to your library and then even shared to your classroom. Don't worry about the language barrier: Edmodo easily translates to your language. It truly is amazing to be able to communicate in such a global way in the best interest in education!

Edmodo offers a ton of support when needed. You can access all sorts of resources in the **Edmodo Help Center** (support.edmodo.com) complete with

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screenshot tutorials, videos, and self-paced courses. They also host **EdmodoCon** each year in August (EdmodoCon.com). It is a free digital conference that attracts educators from around the globe and has top-notch educational speakers as presenters.

I have called myself The EdTech Cheerleader, cheering others to technology integration, and Edmodo is the site that I have cheered most about because of its ease and the fact that the folks from Edmodo (most of whom have education backgrounds) are always listening to teachers, offering strong support, and building Edmodo stronger each day! I recently talked to a middle-school teacher who was introduced to Edmodo this year and he said, "In the decade I have been a teacher, Edmodo is the single most dynamic thing that has impacted the way I have taught." Edmodo is dynamic in all levels of education, and I can only imagine it will make impacts on classrooms around the world more and more as the years go on!

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Aggregator Sites for Content Areas

Teachers are often looking for digital tools that will enable their students to do specific tasks. In the past that meant hours of searching online. In fact, I lost whole weekends seeking free gems my teachers could use. And then I found aggregator sites. Aggregators pull together resources from multiple sites in order to shortcut the searching process. Some aggregators are general purpose; others focus on a particular content area.

When you are looking for just the right interactive websites or tools for students, begin with TeachersFirst and then move to content-area aggregators. The following list represents the best of the aggregators. Preference is given to sites that are extensive, organize by content areas and grade levels, and primarily list interactive sites instead of those that list lesson plans and worksheets.

TeachersFirst (teachersfirst.com) is a premier teacher resource site for interactive internet sites and digital tools. The heart of TeachersFirst (TF) is its extensive database of lessons, units, and web resources. Teachers can search the collection by keyword, grade level, curriculum topic, or content strand. Each entry in the

collection is identified not only by grade-level ranges, but also by icons that iden-
tify the resources at the site, detailed explanations of the site's features, and an "In
the Classroom" write-up on how to use the site with students. As all the resources
are sampled and reviewed by teachers, the realistic descriptions will help you decide
whether particular resources will work well with your students. TeachersFirst also
has resource collections for universal topics, such as 100th Day of School, Martin
Luther King, Jr. Day, Earthquakes, Internet Safety, Presidents' Day, Measurement,
and Elections. These collections pull together topic-specific resources to save you
from searching for them.

VOICES OF EXPERIENCE

A. Ruth Okoye, EdD, Director of K–12 Initiatives
The Source for Learning, Reston, Virginia

TeachersFirst is an evolving community for teachers. The
TeachersFirst team started back in the early days of search
engines—trying to index the web in a way that would help
teachers. In the 20 years that we've been around, our mission
hasn't changed: saving our colleagues time by finding the "good
stuff" on the web and sharing ways that teachers can use the
free, web-based resources that we've found.

Helping teachers to integrate technology in their classrooms requires that we
continue to grow and change. Twenty years ago teachers really needed help to
find materials that they could use. Today, they need our help to understand how
the materials available could be used. To answer that need, we have a number of
ways to help teachers learn about technology implementation.

We try to differentiate for teachers as much as we can, by offering different types
of professional learning opportunities:

- Our blog offers a variety of posts by different members of our team. Each
  blogger has expertise in a different area: tech tools, social learning, and
  media literacy, to name a few.

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- For those looking for hands-on assistance, we offer our OK2Ask web-based workshops. Typically 90 minutes to 2 hours, these sessions include hands-on activities for practice. Participants who have difficulty are encouraged to ask for help from one of the coaches in the session—after all, it is OK 2 ask….

- Another way to ask for integration ideas is via Twitter. Our #Ok2Ask Twitter chats offer the opportunity for dialog around a specific topic. We ask and answer questions as well as suggest resources for further investigation of the chat topic.

- Teachers looking for a "deep dive" into specific topics may find our conference presentation resources helpful. After each conference presentation we create a resource page to expand on the topic and give additional ideas for implementation.

I often tell teachers that if they would search our website before they search Google, they would probably save themselves some time. Our website reviews give an educator's perspective on the resources we index. We also include lesson plan stems to help teachers learn to integrate technology as needed. Since we've been at this for years, our collection is rather large. Teachers can search by topic, grade level, and keyword to find the "just right" resource for their classroom.

Over the years we've found other ways to group resources in our collection. Teachers interested in finding a tool for students to use in projects should look at resources in our TeachersFirst Edge categories. Resources in the Edge can all be used to create student projects or learning objects. Those looking for a few resources on a particular topic—either to get themselves up to speed or to use with their students—should look at our special topics collections. When our team finds 20 to 30 resources on a specific topic, we categorize and group them under the topic heading so that they are easier to find and sift through.

When we have been unable to find a resource to meet teacher needs, sometimes we create them. TeachersFirst original items like Globetracker's Mission, Gettysburg by the Numbers, and MySciLife were created to meet expressed teacher needs.

Membership in our community is free and allows teachers to learn about and share how they use technology resources. Come join us!

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Even if you excel at finding good interactive websites for your students to use, a search in TeachersFirst will bring up sites and tools you probably have not seen before. If you register on the site, you can save your favorites and receive an email every Sunday with tips, featured sites, and other goodies.

Internet4Classrooms (internet4classrooms.com) organizes a large range of educational resources for PreK–12. In addition to links to student activities by grade levels and content areas, you can drill down to the individual standard elements of the Common Core and access online activities mapped to the elements. This site is extensive and concentrates on activities students can do to practice their learning. Some sites may only be skills drills.

Utah Education Network or **UEN** (uen.org/k12student/interactives.shtml) has a less extensive set of links than other sites but has an attractive and user-friendly interface. Links are organized by grade levels, K–2, 3–6, and 7–12, and then by content areas. Within each content area, the links are arranged with icons, and plug-in requirements, such as Flash or Shockwave, are noted.

Instructional Support Websites

For lack of a better place to list my favorite websites, the ones I believe teachers need to know and explore, this section highlights websites that are particularly useful for teachers. Some may be mentioned elsewhere in the book. Instructional support websites are those that offer teachers knowledge and materials for teaching in content areas. Some may contain activities for students that teachers can access, but their primary role is to support teachers as they plan instruction. Of course, this list is not comprehensive.

Instructional Resources for Multiple Content Areas

PBS LearningMedia (pbslm.lunchbox.pbs.org/student-experience) serves schools by providing digital resources for free. The collection has audio, video, images, documents, interactives, and lesson plans. Many digital videos and materials can be downloaded after free registration. Some of the videos can also be mashed or put into a video editing program for teachers or students to manipulate. Teachers also have access to four tools on the site: Lesson Builder, Quiz Maker, Storyboard, and Puzzle Builder. Students may search the collection, but registration is required

for making folders or using the Storyboard. Students under the age of 13 are not permitted to register.

Instructional Resources for Language Arts

Into the Book (reading.ecb.org) has a teacher side and a student side for working with the comprehension strategies. On the teacher side are videos of teachers teaching the strategies, lesson plans for extensions, and other teacher resources. On the student side, students explore each comprehension strategy through videos and activities. Student activities are also available in Spanish. Although this is listed as a K–4 site, most of the student activities would be difficult for anyone younger than Grade 4 without teacher intervention and could be used through early middle school.

Reading Strategies for Students (tiny.cc/57ziwy) lists and annotates reading strategies alphabetically. Almost every reading theory is represented in the list, with excellent ideas for how strategies could be incorporated into classrooms.

Reading Rockets (readingrockets.org) takes teachers some time to explore, but if you teach young students how to read or you work with striving readers, this website needs to be on your radar. Any teacher would love the more than 100 podcasts of interviews with children's book authors as well.

A companion site to Reading Rockets is **¡Colorín Colorado!** (colorincolorado.org), an English/Spanish bilingual site for families and educators of English language learners. Although the site is in English and Spanish only, the strategies are appropriate for working with all students learning English as a second or additional language.

ReadWriteThink (tiny.cc/m9ziwy), sponsored by the National Council of Teachers of English, provides more than 50 interactive tools for students. The site also offers lesson plans that include using the student interactive tools. Although this site is built for student use, teachers will need to explore and find appropriate interactive tools for their students to meet instructional goals.

WritingFix (writingfix.com), the baby of the Northern Nevada Writing Project, has so many writing tools and supports for K–12 classroom teachers—many of which spill into teaching reading as well—that the site is almost overwhelming. You will find something useful on this site for every writing lesson you plan!

Recipes to Good Writing (farr-integratingit.net/Theory/RecipesForWriting) looks like a recipe box, but the "recipe cards" cover different types of writing genres. Each genre has a recipe, graphic organizer, and checklist—all of which can be downloaded and printed. Build your personal knowledge of the writing genres or use the recipes with students.

Instructional Resources for Math

Khan Academy (khanacademy.org) provides supplemental and differentiated video support for students' learning. Currently, the bulk of the videos and practice modules cover secondary topics, but the math section has been completed for Grades K–12. Because the site requires registration, teachers must obtain parental permission to ask students under age 13 to register. Teacher/coach tools on the site are quite helpful for differentiating and tracking students' progress.

The important thing to know about this site is that it is always changing. The developer has made most videos himself and continues to add videos regularly. When students are struggling with math concepts, his method of explaining—a different voice, a different way of phrasing the information—may reach students who never seem to understand you. The videos often have practice exercises with new and different problems every time. When students cannot solve the problems, they can click to access step-by-step tutorials.

Instructional Resources for Science

At **Learning Science** (learningscience.org), teachers and students can find science interactives and resources. Click on a strand of science, then on the standard to see a table of science interactive tools with annotations about the activity, grade level, and length of activity. Other links on the home page go to Tools to Do Science, Google and Science Education, YouTube science channels, and Help Scientists Do Science. In the Help Scientists area, citizen scientists (including young people) can collect data to participate in real science projects. This site combines teachers' resources with students' links.

Arkive Education (arkive.org/education) has free education resources for teaching about the natural sciences. Resources are organized by age group. Each file contains links to amazing wildlife photos and videos, as well as activities and teacher notes.

Instructional Resources for Social Studies

Bringing History Home (bringinghistoryhome.org) has not been updated for several years, but the K–5 curriculum offered on the site is worth exploring. The curriculum at this site supports good instruction in nonfiction reading, visual literacy, and writing.

Instructional Resources for Free Images and Sounds

Teachers and students need sites where they can acquire free-to-use images and sounds for inclusion in their projects. During my research, I saw far too many examples of students copying pictures from the internet without any consideration of who owned the copyright. Teachers should direct students to sites where free images and sounds with copyright attributions are easy to find and use in projects.

Images

Pics4Learning (pics4learning.com) has an extensive curated collection of high-quality photographs teachers and students can use for projects in educational settings. When an image is chosen, the copyright attribution information is provided next to the image. Students will need to copy the information to add to their projects.

FlickrCC (flickrcc.net) has photographs uploaded by individuals who have chosen to use the Creative Commons license. Students can copy the attributions on the same page as the photos.

Photos for Class (photosforclass.com) is unique in that the copyright information is embedded in the photos, so it doesn't require a separate step. The goal of the site is to provide safe images for educational purposes with accurate citations. The images are taken from Flickr and Pixabay.

Images from Pixabay (pixabay.com), **Pexels** (pexels.com), **Kaboompics** (kaboompics.com/gallery), **Unsplash** (unsplash.com), **Negative Space** (negativespace.co), and **Gratisography** (gratisography.com) are all published under Creative Commons Open, which means they can be used for educational purposes without attribution. However, teachers should caution students that the sites do not necessarily filter the search results for child-appropriateness.

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Sounds

YouTube Audio Library (youtube.com/audiolibrary/music) has collections of free music and free sound effects for use in videos.

SoundGator (soundgator.com) indicates the free sound effects on their site can be used without attribution for any projects.

Sound Bible (soundbible.com/royalty-free-sounds-1.html) has a curated collection of sounds taken from Creative Commons and Public Domain, so they can be used without cost. Creative Commons clips must be attributed to the creators.

Free Stock Music (freestockmusic.com) requires free registration on the site before you can download music. All the music on the site is free to use and free from attribution, although I would require students to indicate they downloaded the sounds from this site.

Professional Development Resources

One key to effective practice is continual professional development in best teaching practices. No matter what digital tools you use, if your instructional methods do not promote student learning, you will not be effective.

Inservice training and professional development offer two different types of experiences for teachers. Inservice training is when teachers attend required district- or school-level training to learn about new curriculum, standards, or tools. The purpose of inservice is to promote the institution's agenda. Inservice may provide information about the institution's approach to curriculum, but it often has little influence on teachers' professional practices.

Professional development happens when teachers pursue assistance to improve their professional practices. Because different individuals have different needs, rarely will a whole school or district engage in professional development. Instead, teachers seek out rich learning opportunities appropriate for their own professional growth. In other words, inservice is generally imposed, and professional development is a teacher's choice. Of the two, professional development has the potential to trigger within teachers the desire to make changes to improve their modes of instruction.

💬 VOICES OF EXPERIENCE

Sheri Edwards, teacher and technology director Nespelem School
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Is your school emerging into the journey of infusing technology into lessons? Does the process seem overwhelming? It did to our school district, but after attending an OK2Ask session on schoolwide literacy, I understood that our novice tech teachers (those not tech savvy) needed a slower approach.

As a Google Apps for Education school, our staff needed some introductory sessions on the tools they would use most. Because of the session, I chose only three tools to introduce (email, calendar, blogs) over six sessions, which would benefit teachers' communication with each other and with families.

In addition, the session model used by OK2Ask provided a template for each of the six hour-long sessions at our school: Expectations, Exploration, Explanation, Engagement with Explanations, and Expressions (reflect and assess).

In an OK2Ask session, the processes of expecting and exploring help participants feel comfortable and ask questions about the technology. A demonstration (explanation) provides the background for engaging with the tool. Finally, participants express what was learned and evaluate the tool, strategy, resources, or process for use in the classroom or school.

I was uncertain how to help my colleagues manage the changes that technology was bringing to our school. Taking a free webinar about using technology eased our journey and saved time, travel, and money. I learned a strategy for implementing technology tools throughout the school and a process for presenting the professional development to staff.

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Online learning can provide convenient, targeted professional development because the training can be individually accessed and managed. With online coursework, teachers can access just-in-time help, often provided in effective

instructional modes. For instance, many online professional development courses include videos of teachers demonstrating best practices in their classrooms.

Teachers rarely see other teachers teaching, so having access to videos of other teachers' classrooms has significant benefits. Online professional development also allows for individualized staff development; teachers can choose staff development in areas where they are currently trying to improve their practices. This makes online professional development, particularly when it is also free, a blessing for teachers and administrators.

Free, high-quality professional development is available from several online sources. Some may qualify for continuing education units (CEUs). In some districts, for example, teachers can write up independent or group studies to get credit for licensure and/or pay increases. Check to see whether your district and/or state will confer CEUs with evidence of completion of online modules. The chance to earn CEUs while you learn, at home in your jammies or in a study group, will keep you motivated! The following resources provide free professional development for teachers in specific content areas.

ISTE (iste.org) provides members with tools and networks to improve professional practices. Membership requires an annual paid subscription (included in conference fees if you attend the annual conference). ISTE published this book and many others that are useful for teachers who are integrating technology in their classrooms.

TeachersFirst (teachersfirst.com) offers professional development on technology integration through OK2Ask sessions. The webinars are hands-on experiences moderated by teachers. For instance, I took an OK2Ask online workshop on augmented reality to assist me in writing about AR in this book. During the session, I saw examples of AR projects, tried out some new technology tools, explored an AR app, and planned a potential AR lesson. I also met Lula Garcia, who wrote the AR Voices of Experience for this book.

Annenberg Learner (learner.org) offers online professional development courses in all content areas for K–12 teachers. A list of courses can be accessed at this page of the website: learner.org/workshops/workshop_list.html. All materials, video and print, are free, and teachers can use them in three ways: for self-guided study, as a study group with a facilitator (guide available online), or as a graduate course

through Colorado State University (fee required for credit). This high-quality professional development training would not be easy to find locally.

BioEd Online (bioedonline.org) hosts free online science workshops and short courses from the Baylor College of Medicine. Teachers, scientists, and science educators provide the courses' content. Teachers receive a certificate for contact hours upon completion of each workshop or short course.

Concept to Classroom (thirteen.org/edonline/concept2class) is a free series of self-paced, K–12 workshops on teaching and learning. Workshops include materials and videos. The site also provides documentation materials, including a letter for the superintendent, an extensive syllabus, and a post-course rubric for evaluation to assist teachers in requesting continuing education units from their districts.

Library of Congress Online Modules (loc.gov/teachers/professionaldevelopment) are free, one-hour, self-directed, online learning modules that focus on copyright law and using primary sources for K–12 teachers. At the conclusion of each module, teachers receive certificates of completion that may qualify for professional development hours.

TPS Teachers Network (tpsteachersnetwork.org) is a social media network of teachers who use primary sources, primarily from the Library of Congress, in their classrooms. Registration is free, and teachers share their strategies, tools, primary sources, and lesson plans on the site.

edWeb (home.edweb.net) provides personalized professional development through webinars and webinar podcasts. You can also join a community with interests similar to yours.

Microsoft Educator Community (education.microsoft.com) connects teachers with professional development opportunities as well as a network of educators who use technology in their classrooms. Similar Personal Learning Network communities exist at **Google for Education** (edu.google.com/resources/communities) and **Edmodo** (edmodo.com/topics).

Assessment

Effective teachers use assessment wisely to determine where students may be struggling with a concept, plan for the next lesson, and help students self-assess their progress. Often assessment is poorly understood, designed, and implemented. I imagine lots of teachers, like me, never received any professional development in assessment. Then, when I participated in a research project observing teachers' assessment practices, I grew to appreciate how teachers and students can improve learning when assessments are used well.

In my early teaching years, I used only summatives, which created a dilemma for my students. They had one shot at guessing what I wanted them to parrot back at me. Each summative was a "do or die" situation. Had I known about formative assessments, I could have differentiated my instruction so much better. I would have known who was already on target and who needed support. Instead, I sometimes didn't know what students misunderstood until they all missed the same questions on the summatives.

So, here is a brief summary of formative assessment and some tools. Formative assessment checks for student understanding in the midst of learning. The assessments are not graded, but rather are intended to pinpoint where individual students are struggling with the content. The assessment data has to be analyzed, sometimes in the moment, and then acted on. The goal of clickers has always been to enable teachers to assess for understanding. When teachers collected data with clickers and then continued on without adjusting their teaching to respond to the data, researchers found some students started responding erratically. Don't collect data if you don't plan to use it to guide instruction.

A teacher recently told me she'd like to use a digital formative assessment tool but didn't know what data to collect or what to do with the data. While I was observing in a classroom recently, I watched a teacher review figurative language terms a couple of days prior to the scheduled summative. The teacher used **Kahoot!** (kahoot.com), which is great fun for students. I observed several things. First, I observed that some students watched the one boy who was noted to be the best student in the class and always chose the same answer he chose. That skewed the data. Then when the review ended, the teacher told students to write down any answer they got wrong. She depended on them to remember what they hadn't known. Finally, she told them to study the terms if they had missed any.

I saw similar practices in many classrooms (and I have been guilty of the same, so I'm not pointing fingers). The teacher had the best intentions. What she didn't have was a good understanding of how to use a fun game as a formative assessment. For one thing, student data was automatically collected by Kahoot! throughout the game, so the teacher could have seen where individual students had made errors. Second, she could have stood in the back of the room with her computer and seen exactly how students were getting their answers. Finally, she could have analyzed the data and planned an activity for the following day where she met with students having the most difficulty for re-teaching, and engaged the remaining students in games or activities where the students with the most solid understanding acted as reviewers for students with a few holes in their knowledge.

Almost anything can become a formative assessment. Exit slips where students identify what they learned and where they still had questions are formative assessments. Roaming the room and noting on a list the strategies students are trying for solving a math problem is a formative assessment. Scanning a room with a cell phone's **Plickers** app to gauge how students responded to a multiple choice question about content being taught (plickers.com) is an assessment. Giving an online quiz, conducting a survey, and asking students to fill out self-assessment rubrics are all good formative assessment tools, provided the information is analyzed and instruction changes to differentiate for those who do and don't understand.

The best example I observed in several years of being in classrooms was a middle-school math teacher who assessed her students formatively about every two minutes. The students didn't know they were being assessed because she used so many strategies. Her teaching adjusted constantly. Sometimes she rearranged partners; sometimes she required lunchtime study hall; sometimes she rewrote the next day's problems. She often asked students to indicate how comfortable they would be teaching the concept to a classmate. The teacher had trained all students on her expectations for tutors, because any student might become a tutor at any time. The students confident about that day's math concept became 10-minute tutors. Peers could choose any tutor and work in that small group for 10 minutes. The teacher took notes constantly. Because she had been using formative assessments for many years, the teacher's practices were second nature. She's the exception. But we can learn from her example.

Technology offers many tools that can be used to assess students' understanding—and often those tools automatically store the data for teachers' convenience.

NWEA has a blog post on 65 digital tools that support formative assessment practices (tiny.cc/fn0iwy).

Effectively using formative assessment data is not easy, nor is it natural for most teachers. Yet, it is, perhaps, one of the most powerful ways to improve teacher practice and student learning. If you haven't been using formative assessment, think about pursuing professional development on the topic. Even watching some YouTube videos on formative assessment can help.

💬 VOICES OF EXPERIENCE

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Assessments. As educators, we are always planning how to assess our students to ensure that we are not only teaching the skills, but that our students are indeed learning the skills so they can authentically use them. There is no other way to do this besides assessing our students. However, the way we assess them can vary greatly. One of the ways we can assess our students is through the use of technology. There are many resources to help educators do this, so to narrow my focus, I will concentrate on four resources that can be used to assess students without using a red pen: Kahoot! (kahoot.com/what-is-kahoot), Quizizz (quizizz.com), EdPuzzle (edpuzzle.com), and Google Forms (google.com/forms/about).

Kahoot! and Quizizz are both online quiz systems where a teacher can assess students on any content. Teachers can use both of these tools in the classroom in a live mode, where the entire class is working on the assessment together, or in a self-paced mode, where students can work independently. In the live mode, the teacher can either use 1:1 mode or team mode. With both of these, students take the assessment together. Educators use this to see how much students know (think bellringer or exit ticket) or as a review of content. My suggestion is to not use this mode as an actual grade because students may make mistakes when trying

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to answer a question quickly versus taking their time to answer it correctly (there is a competition component to these programs). However, I do suggest using the Challenge mode in Kahoot! and the Homework mode in Quizizz for your students to work independently to show their mastery of skills. This can be used with any content where multiple-choice questions can be used as the assessment. Then, that grade can be used as an individual assessment grade.

If the teacher is looking for various question types for his/her assessments, a Google Form or an EdPuzzle would be a great fit. A Google Form can be used as an online assessment to assess any content area. There are varying question types (short answer, paragraph, multiple choice, multiple select/checkboxes, dropdown, file upload, matching/categorization/grids, etc.) that can be used, and the educator has the choice of either allowing the system to grade the assessment or grading it him/herself. The results come as a spreadsheet, as individual assessment papers per student, and in charts and graphs. Similarly, educators can use open-ended or multiple-choice questions with EdPuzzle as well. With this tool, teachers can put questions directly within a video to create a video quiz. There are videos from multiple sources already uploaded in the system, such as TED Talks, YouTube and Khan Academy videos. The teacher can also create and/or upload his/her own video. The results can then be used as an individual assessment grade.

Using these tools can allow a teacher to integrate technology while assessing the skills of students. These four tools are perfect for collecting assessment data and reviewing which skills need to be retaught to students. Another benefit of online assessments is that you receive the data in a timely fashion (as soon as the student is finished with the assessment). All four of these tools can also be with Google Classroom. Implementing various tools to assess your students can help you collect the data you need while bringing innovative creativity to your students' learning.

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Teacher Instructional Resources Highlighted in This Chapter

Website	Resource Type	Focus
Arkive Education		Science units on natural sciences
Bringing History Home		Rigorous history curriculum
¡Colorín Colorado!		English/Spanish bilingual reading
Edmodo	Learning management system	Involves a strong educator community
Fakebook	Protected social media	Communication
FlickrCC	Photo collection	Free digital photos for education
Free Stock Music	Sound collection	Free sound effects and music for education
Gratisography	Photo collection	Free digital photos for education
G Suite for Education	Learning management system	All Google tools
Internet4Classrooms	Aggregator	All content areas
Into the Book		Reading (comprehension strategies)
Kaboompics	Photo collection	Free digital photos for education
Khan Academy		Math video lectures
Learning Science	Aggregator	Science interactive sites
Negative Space	Photo collection	Free digital photos for education
PBS LearningMedia	Aggregator	Digital media resources for all content areas; highlights science
Pexels	Photo collection	Free digital photos for education
Photos for Class	Photo collection	Free digital photos for education
Pics for Learning	Photo collection	Free digital photos for education
Pixabay	Photo collection	Free digital photos for education

Website	Resource Type	Focus
Reading Rockets		Reading resources and author podcasts
Reading Strategies for Students		Annotated reading strategies
ReadWriteThink	NCTE	Interactive language arts tools
Recipes to Good Writing		Writing genres
Schoology	Learning management system	A strong iPad interface
Sound Bible	Sound collection	Free sound effects and music for education
SoundGator	Sound collection	Free sound effects and music for education
Tchat	Twitter filter	Communication
Teachers on Pinterest	Aggregation of sites	Teacher boards
Unsplash	Photo collection	Free digital photos for education
Utah Education Network	Aggregator	All content areas
WeSchool	Learning management system	
WritingFix	Northern Nevada Writing Project	Writing tools and supports
YouTube Audio Library	Sound collection	Free sound effects and music for education

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Professional Development Sites

Site	Focus	Format	Credit
Annenberg Learner	All subject areas	Online self-study courses, lengths vary	CEUs or graduate credit for a fee
BioEd Online	Science	Online self-study courses, 3–6 contact hours	Certificate of participation
Concept to Classroom	Pedagogy	Online self-study courses, 30–35 hours	Provides materials to request CEUs from your administrator
Library of Congress Online	Copyright and primary sources	Online self-directed workshops, 1 hour	Certificate of participation
TeachersFirst OK2Ask	Technology integration	Webinars, 75 minutes	Certificate of participation
ISTE	Technology integration	Professional learning communities for members only	None
TPS Teachers Network	Primary sources pedagogy	Professional learning community	None
EdWeb	Technology integration and pedagogy	Professional learning communities	Certificate of participation
Microsoft Educator Community	Technology integration	Professional learning community	Badges
Google for Education	Technology integration	Professional learning community	None
Edmodo	Technology integration	Professional learning community	None

Final Thoughts

Try to choose a path to technology integration that will fit your teaching style and engage your students. Remember, even though you read about many great tech tools, implement one at a time, with a goal of three maximum in a school year. When you focus on giving students more than one opportunity with a tool within the school year, especially if the tool is new to them, three changes is a lot!

Many thanks to the Voices of Experience contributors who shared their expertise throughout the book. Their experiences demonstrate how any path can lead to great outcomes for students. Let their models be your inspiration!

Remember to visit the book's website, bonihamilton.com, to access the following links, research, and updated information:

- Live links to website sorted by chapter
- Research to support the claims in many chapters
- Samples of projects when available
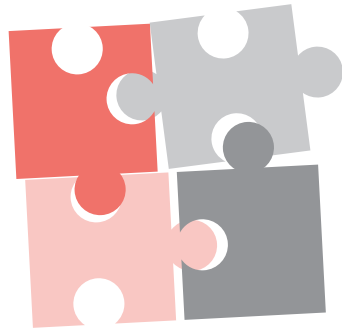- Updated information about the chapters, links, and author

CHAMPIONING TECHNOLOGY INFUSION

IN TEACHER PREPARATION

A Framework for Supporting Future Educators

EDITED BY ARLENE C. BORTHWICK, TERESA S. FOULGER, KEVIN J. GRAZIANO

The following excerpt is from this book.
Check out the complete book at iste.org/InfuseTech

The Necessity of Preparing Teacher Candidates to Teach Online

MICHAEL MCVEY
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Overview

The tools and applications for online instruction appropriate for PK–12 teaching have increased in quality, and soon access to them will be nearly universal (Consortium for School Networking, 2018). The consequence of this vastly improved online platform is that many teaching activities traditional to the physical classroom may move beyond those classroom walls and into a *virtual* teaching space. Teacher preparation programs will need to prepare teacher candidates to use web-based tools and related instructional design in their teaching practice.

Excerpted from Chapter 6, "The Necessity of Preparing Teacher Candidates to Teach Online."

Embedding Instructional Design for Teaching Online

Preparing teacher candidates for an online teaching experience means preparing them to overcome challenges caused by the lack of face-to-face exchanges with learners, what Moore (1973) referred to as transactional distance. During online instruction, teacher candidates experience an increase in transactional distance and resulting difficulty in communication with learners; candidates begin to note the difficulty of knowing how well learners have understood their instructions. Teacher candidates cannot scan their online students for typical cues such as gestures and facial signals or cast a quick glance at work in progress. Online-based teaching models can help candidates plan ways to overcome a disruption in communication that may be more natural in face-to-face transactions. This is only one instructional design element pertinent to teacher candidates' preparation.

Strategies for effective teaching in fully online environments can be just as effective for teaching in partial or blended online settings. Modifying a lesson for an online learning environment can reinforce skills that teacher candidates develop in preparation programs geared solely for traditional teaching. Planning to teach students who are remotely situated can improve skills in instructional design as teacher candidates 1) develop a clear pathway for progress through a course or lesson, 2) differentiate instruction for varying learner needs, 3) increase learner engagement through social interaction, and 4) increase access to relevant learning materials. Although teacher preparation programs extensively cover lesson planning, designing for the participation of remote students requires teacher candidates to acknowledge a host of factors that are out of their immediate control. The inability to answer questions or provide interventions the moment they arise means that teacher candidates must clearly introduce online lessons and intentionally design all instructions *in anticipation of* the varied learning needs of students whom they cannot observe (Reiser & Dempsey, 2018).

To anticipate these needs, teacher candidates should understand the sequence of learning activities that led up to their online lesson. They must provide a clear pathway through the online unit, sometimes through built-in redundancy of directions or by including progress markers throughout. As part of the design process, teacher candidates will need to account for the varying learning needs of their students, consider accessibility options, and make appropriate modifications

Excerpted from Chapter 6, "The Necessity of Preparing Teacher Candidates to Teach Online."

to content and presentation. These modifications are especially important when providing links to websites, online tools, or videos.

The International Society for Technology in Education (ISTE) released the ISTE Standards for Educators (2017), which provide an excellent guide for teacher educators to help teacher candidates master the educational technologies they will encounter as they develop their teaching skills. Some standards fit well with the goals of infusing teacher preparation programs with curriculum that addresses online teaching skills. For example, consider Standard 5, Designer:

> Educators design authentic, learner-driven activities and environments that recognize and accommodate learner variability. Educators: Explore and apply instructional design principles to create innovative digital learning environments that engage and support learning.

Teacher educators can take the following approach, grounded in the work of Reiser and Dempsey (2018), to infusing instructional design strategies when preparing teacher candidates to meet ISTE Standard 5.

Analysis. In the instructional design process, teacher candidates must analyze learners, their learning contexts, and the objectives of the instruction. Learning analysis would include an examination of learner skill level, cultural background, attitudes, and motivation. Teacher candidates must also become proficient with helping learners to access content and instruction in online learning systems. Analysis would also include the identification of learning objectives.

Selection. In this time-intensive phase, teacher candidates would become proficient in identifying content sources and selecting lessons to support unit goals. They would also need to learn how to develop new digital content and determine applications and techniques for supporting group interaction as well as methods of assessing learning, both formative and summative.

Implementation. In this phase, teacher candidates would practice the lesson or unit with students either in a real classroom setting or with fellow teacher candidates. The feedback from learners is an essential iterative element of the instructional design process. Through this feedback, they would be able to make informed modifications to the course interface, content, and instruction to meet the needs of learners.

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Tools Needed to Teach Online

Access to online tools and applications would allow teacher candidates to learn about ways to engage with learners and to explore how to counter obstacles common in traditional interactions. Most of these tools and applications are common to learning management systems that teacher candidates will encounter in their classrooms. Each of the general categories of tools in Table 6.1 provides what are known in the literature as affordances, with each addressing unique challenges and offering opportunities for the integration of technology into the curriculum. Note that the column labeled "Communication Medium" is based on the Community of Inquiry (CoI) theoretical framework that represents a process of creating meaningful learning experiences through the development of three interdependent elements: social, cognitive, and teaching presence (Garrison et al., 2000). For more information on CoI, see the end of this chapter.

Table 6.1. Online Tools and Pedagogy

Communication Medium from CoI Framework	Online Tool Example	Skill Overview	Pedagogical Challenge
Social Presence	Live Chat	This synchronous tool can be a stand-alone app but is often built into shared notetaking applications and can enhance collaborative interactions.	Synchronous chats with larger groups require teacher candidates to maintain a sense of order and clarity and develop their skills as moderators.
Supportive Discourse	Discussion Board or Forum	This asynchronous tool enables online learners to conduct in-depth conversations among themselves over a longer period and share images or supporting links and documents.	Online discussions require teacher candidates to develop prompts that will generate relevant discussions leading to deeper inquiry or concept building.
Cognitive Presence	Quiz Tools	Quiz-making tools allow teacher educators to create a variety of question types from multiple choice to open-ended that they can use as summative or formative assessments.	Online quizzes require teacher candidates to use the many options of this tool to prompt for deeper understanding by providing enriching and encouraging feedback.

Excerpted from Chapter 6, "The Necessity of Preparing Teacher Candidates to Teach Online."

Communication Medium from CoI Framework	Online Tool Example	Skill Overview	Pedagogical Challenge
Setting Climate	Form-Making Tools	Online forms can be embedded into websites, documents, and even video and can provide formative data to determine engagement with lesson material.	Form tools require teacher candidates to consider ways of developing formative assessments that encourage and engage students.
Teaching Presence	Web Design Options	Teacher candidates can set up an online learning space with a focus on readability and accessibility of materials.	Control over the online presentation of material requires teacher candidates to structure lessons that are accessible and engaging.
Selecting Content	Website Creation Tools	Teacher candidates can gather and manage the presentation of varied resources.	Curating online resources requires teacher candidates to review and select the most appropriate materials.

As teacher candidates develop their skills at designing instruction for online learning environments, perhaps by creating thematic online learning experiences, short lessons, or whole units, they will learn how to use the affordances of learning management systems to enable collaborative activities and develop increasingly refined methods of interacting with learners. Learning to use these tools complies with ISTE Standard 6. Facilitator:

> Educators facilitate learning with technology to support student achievement of the ISTE Standards for Students. Educators: 6b. Manage the use of technology and student learning strategies in digital platforms, virtual environments, hands-on makerspaces, or in the field. (ISTE, 2017)

As colleges and schools of education infuse technology integration curriculum throughout their programs, specifically curriculum related to online instruction, it is important to note that teacher candidates are still in the process of developing basic competencies in curricular design for face-to-face classrooms. Adopting a pedagogical strategy in a classroom is clearly a novel activity for most teacher candidates at this stage of their development. Thinking about pedagogical strategies for online teaching can provide important opportunities to think deeply about teaching in general. Teacher functions such as providing resources, scaffolding

Excerpted from Chapter 6, "The Necessity of Preparing Teacher Candidates to Teach Online."

learning activities, and becoming more deliberate about accommodations, differentiation, and personalization can be more thoughtfully planned, practiced, and developed in online platforms.

Conclusion

Colleges and schools of education have faculty with years of experience preparing teacher candidates for careers in face-to-face classrooms. As the potential for delivering learning experiences shifts into online environments, a solid understanding of the technologies and strategies for online teaching will become essential to the success of teacher candidates as they launch into their careers as certified teachers.

Online teaching should not be viewed as an add-on to teacher preparation programs; in fact, it is essential for a flourishing program that seeks to fully prepare the next generation of educators and should be infused throughout the entire preparation experience. By the time they graduate, teacher candidates graduate, they should be versed in using tools and applications for teaching online. Learning to select and integrate technology tools and applications has the benefit of helping teacher candidates become better teachers in any learning environment. The instructional design skills needed to teach online are no different from the skills used to engage and assess students in traditional classrooms. CoI, the pedagogical framework discussed in this chapter, can assist teacher candidates as they curate content and resources, design for digital environments, and build their lessons around a supportive and interactive climate for learning with formative and summative assessments clearly aligned with instructional goals.

As I found in talking with graduates of my program, if teacher preparation programs prepare new teachers only for the face-to-face classroom, they are not preparing them to teach in today's world marked by digital connectivity. Colleges and schools of education must take the lead in providing a research-informed vision for online experiences in PK–12 teaching and for following through on that vision by addressing online teaching in their preparation programs. To do otherwise would be a critical lapse on our part.

Excerpted from Chapter 6, "The Necessity of Preparing Teacher Candidates to Teach Online."

A Theoretical Framework for Online Teaching and Learning

As colleges and schools of education focus on how to provide a curriculum for teacher preparation that includes training in online instruction, one theoretical model could prove beneficial. Decades after its first appearance, a frequently referenced model relevant to online learning is Community of Inquiry (CoI) (see Figure 6.1). In this framework, teachers create deep and meaningful learning experiences through the interplay of three interdependent elements or presences: the social, the cognitive, and the teaching. These presences exist within the interactions of teachers and their learners (Garrison, Anderson, & Archer, 1999).
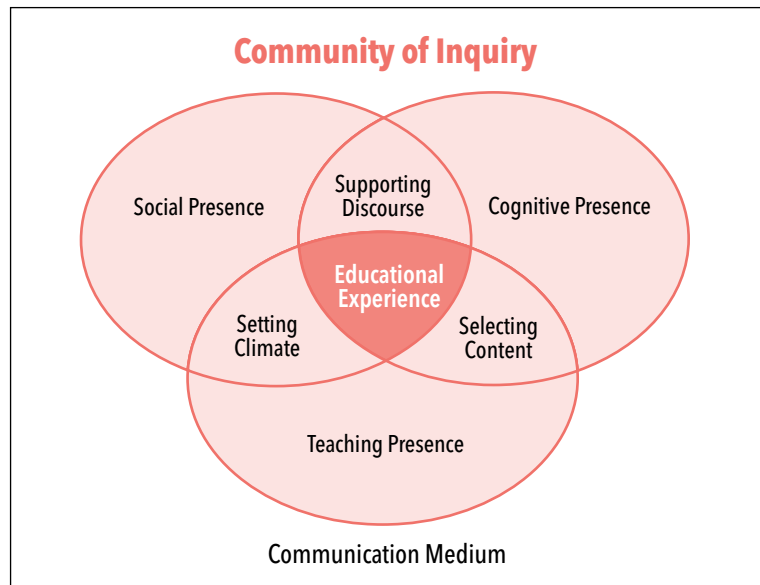
Figure 6.1 Community of Inquiry (CoI) Framework. Reprinted from *The Internet and Higher Education, 2*(2–3), D. Randy Garrison, Terry Anderson, Walter Archer, Critical Inquiry in a Text-Based Environment: Computer Conferencing in Higher Education, Page 19, Copyright 1999, with permission from Elsevier.

Excerpted from Chapter 6, "The Necessity of Preparing Teacher Candidates to Teach Online."

Cognitive Presence focuses on how online learners interact and engage with course content and with each other. An event initiates learning that activates curiosity and prompts explorations to seek the answers to questions and the solutions to problems (Shea & Bidjerano, 2009). For this presence, teacher educators and teacher candidates develop skills necessary to ensure the materials used in the course or lesson are appropriate to grade level, reading level, and overall course learning objectives, and are presented in a manner that will lead toward understanding or application of the content. An excellent starting place for developing the skills to use available tools is by curating digital resources. As teacher candidates master the basics of finding relevant online resources to support learning objectives in an online lesson, they also learn to discern which digital artifacts are age or grade-level appropriate or need modifications for English language learners or students with special needs.

Social Presence focuses on the importance of the social-emotional aspects of online learning. This attribute often drives the climate of the course and describes how individuals identify as a part of the learning community within an online course (Garrison et al., 2000). For this presence, teacher candidates would need to develop the skills necessary to engage their students in learning processes by using such techniques as framing appropriate discussion prompts, developing collaborative projects, and determining ways of reaching out to students to encourage them. As teacher candidates master the skills needed for the curation of digital resources, they can begin to work out how to frame those same digital materials in a manner that would interest and engage learners. Teacher educators can model ways of developing a trusting relationship with learners and seek to develop interpersonal relationships within an online class or online components of a traditional class.

Teaching Presence focuses on the teacher candidate as designer and developer of online learning environments as well as the facilitator of cognitive and social processes in collaboration with learners (Akyol & Garrison, 2013). The improved functionality of learning management systems has enabled a multifaceted approach to designing for online learning. For this presence, teacher candidates would need to develop skills necessary to engage students through techniques in instructional design to effectively present content, activate prior knowledge, provide appropriate practice intervals, and determine ways of assessing knowledge and skills both formatively and summatively. Online

Excerpted from Chapter 6, "The Necessity of Preparing Teacher Candidates to Teach Online."

teaching requires an intentional coordination of the interactions of learners with each other and with the instructor. Success with the teaching presence requires planning and an understanding of the needs of students.

Teacher candidates would need to practice using all three presences in the CoI framework as they develop an online learning environment either as a stand-alone lesson or in the context of a larger unit. Teacher educators can also use the CoI framework as a basis for reviewing teacher candidate progress as they develop these skills. One excellent strategy for developing the skills needed in all three presences is to provide teacher candidates with their *own* course shells in their methods class or student teaching seminar. It is often possible to set up instructor accounts for teacher candidates, depending upon the learning management system used by an institution, which will allow teacher candidates to create their own learning environments sometimes known as shells or sandboxes. Some colleges/schools of education have used open-source tools such as Moodle to provide these shells, while others make use of Google Classroom. The learning management system chosen is less important than providing teacher candidates with a space and creative license to design and practice teaching using an online structure.

From a faculty perspective, a little encouragement goes a long way. The CoI framework can support the expectation that teacher candidates will develop an online lesson to enhance their student teaching experience. Intermediary steps that lead toward the skills required of online teaching could dovetail well with skills taught through existing teacher preparation coursework. As an example, take the task of developing an assessment using an online discussion forum. As teacher candidates use their content knowledge to design an online lesson, they may use a discussion forum as a formative assessment tool. This activity would be a good place to practice designing prompts grounded in the content (cognitive presence) and, through careful monitoring of the discussion, to ensure students stay on track and are respectful of each other's opinions (social presence). The overall placement of such an assessment could take advantage of the interactivity of online environments and be designed in such a way that they complement the overall lesson design (teacher presence).

Teacher candidates can further practice formative assessments by developing open-ended questions to supplement a video they might be using as a digital resource. Sites such as TedEd (ed.ted.com/) allow teacher candidates the opportunity to create a video and develop a variety of assessments ranging from more constrained

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multiple-choice questions to less constrained, open-ended questions (Scalise & Gifford, 2006). Google's suite of tools allows for the creation of simple forms and quizzes with relative ease. Certification programs that put teacher candidates on a pathway to develop these resources and provide practice teaching opportunities will help them exercise the creative skills needed to effectively teach online upon graduation.

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Excerpted from Chapter 6, "The Necessity of Preparing Teacher Candidates to Teach Online."

PART 2
Creativity

chart a
new course

a guide
to teaching essential skills
for tomorrow's world

RACHELLE DENE POTH

SHOW WHAT YOU KNOW

Bringing Stories to Life

As Sir Ken Robinson said, "You can't just give someone a creativity injection. You have to create an environment for curiosity and a way to encourage people and get the best out of them" (n.d.). In this chapter, we will address how you can create just such an environment, as well as the importance of giving students options for showing their learning and becoming creators in the classroom. Along the way, you'll explore the benefits of using emerging technologies and ideas to get started. In this chapter, you will learn:

- How to promote student voice through digital storytelling
- How digital tools can positively impact and help form peer relationships
- How to create immersive and engaging learning journeys for students
- How to promote student-driven learning through app smashing and lesson flows

Promoting Learning Through Digital Storytelling

Storytelling is a great way for students to build communication and collaboration skills and to apply their learning in personal, meaningful ways. In my classroom, using a variety of digital tools with my students for storytelling activities has served as a catalyst for increasing student engagement and empowering student voice as students can share their learning using the tool or style that meets their own interests. Enabling students to make their own decisions, engage in self-directed learning, and explore new tools and technologies leads to positive and more personalized learning experiences for them (Gerstein, 2013). Not only can we increase students' confidence in learning, but we can also promote more social-emotional learning skills, such as collaboration and relationship building. (See Chapter 2 for more discussion of SEL.)

Digital storytelling offers a way for students to make something unique and authentic to represent their understanding of the content material. Empowering today's learners to make decisions about the means to communicate this information back to us is important for them in developing critical future-ready skills. Relatedly, digital storytelling provides opportunities to address such ISTE Standards for Students as Creative Communicator, Computational Thinker, and Innovative Designer.

educator stories

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The awesome thing about digital storytelling is that it helps honor various learning styles. Sometimes we need to start with the image before we can start with words. It helps to flip the old-school thinking that design and images and creation are the bonus after writing. Creating can and sometimes should be the beginning bit, and it allows the writing to flow. Digital storytelling enables us to share our stories with more people quicker. It empowers all and helps level the playing field.

Think about some lessons that you teach in which students would benefit from additional time or a different format beyond the class period to reflect, share ideas, or engage with the content in a more authentic way. This is where

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digital tools can be leveraged to open up more time for students to share their thoughts and to work independently beyond the school day. Through audio and video options or using interactive lessons, we can expand the opportunities for our students. One of the biggest benefits of using technology is that students can participate wherever they are and whenever it is most convenient for their schedule—learning on the go!

Through online platforms, students can reach a wider audience with their projects as well. It's important for students to get feedback on their work not just from us but also from other students in the classroom and even members of the larger school community. By sharing their voice through tools to record podcasts; to running a school news program; or to creating a movie, a comic strip, or an animation, students can share what they're doing and thinking, and how they're creating, learning, and growing in our classrooms. This is how we can share what education looks like to the school at large.

What are some unique activities and tools you can use to have students tell a story, present information, share learning experiences, and build vital skills for their future? The sections that follow detail some of my favorites. As you consider each activity or tool, stay informed of any technology or age requirements and be sure to communicate these with your students' families. Although many of the strategies in this book can be used in the lower grades as well as in higher education, it's always important to consider the students' ages and, of course, the access needed for the resources.

Animations and Cartoons

By creating animations and cartoons through formats such as comics or stop-motion video, students can represent what they are learning in a class, summarize concepts, and think critically about how to convey the most important information. This can promote student engagement and lead to an increase in motivation for learning, while enabling students to apply their knowledge in more personalized ways. Some digital tools to choose from are Blabberize (**blabberize.com**), Chatterpix (**duckduckmoose.com**), Powtoon (**powtoon.com**), Pixton (**pixton.com**), and MakeBeliefsComix (**makebeliefscomix.com**). These tools can also be used to hook students into a lesson (**FIGURES 4.1** and **4.2**).

FIGURE 4.1 A student project created using Pixton for a medical vocabulary unit

Remember, however, that technology is only one means to your goal of having students extend their learning and build skills at a pace that's comfortable for them and in a way that meets their interests and specific needs. Some students might be hesitant to use technology, and I've had several students who simply preferred traditional paper and other materials. Let them hand-draw their cartoons, but then take the project to another level by having them share their work as a public product using one of the digital tools available to communicate, collaborate, create, innovate, and demonstrate their learning. Regardless of which options students choose, they will be applying skills at a higher level than traditional projects and assessments might offer.

FIGURE 4.2
Creating with Chatterpix

Sketchnoting

Sketchnoting, or visual note-taking, can be applied in many ways for learning. Even students who are not fans of drawing might enjoy the opportunity to engage in something that is fun and different and to see what their classmates create. Encourage students to represent a concept, summarize a chapter,

explain an idea, or express who they are using sketchnotes (**FIGURE 4.3**). It will not take long for students to make connections with their peers and learn more about each other. With this activity, again, suit the tool to the student: There are digital drawing apps available, such as Paper (**paper.by-wetransfer.com**) or students can sketchnote by hand with paper, pens, and pencils and then convert their product into a digital format for posting and sharing (Rohde, 2013).

Presentations

Creating presentations using Google Slides or Microsoft PowerPoint is a good way to help students build basic technology skills and more. Students can collaborate on projects and experience the power of learning anywhere at any time. For example, try having students collaborate on a review presentation in preparation for an assessment or as a way to introduce themselves to classmates. Rather than creating a review packet at a unit's end, I have my students each pick topics and create a slide with a variety of text, images, and videos. Not only does the resulting class slideshow provide a shared resource for review, but the project also promotes digital citizenship skills, collaboration, communication, and creativity.

FIGURE 4.3
Student-created sketchnotes to inform about digital wellness and digital literacy

Storyboarding

Storyboarding is beneficial for having students narrate a story, explain a process, or organize thoughts around a topic or theme. It promotes critical thinking, communication, and creativity, and it fosters innovation in designing and empowers students in the learning process. They take control of how they show what they have learned and can demonstrate what they can do with the material in their own personal way.
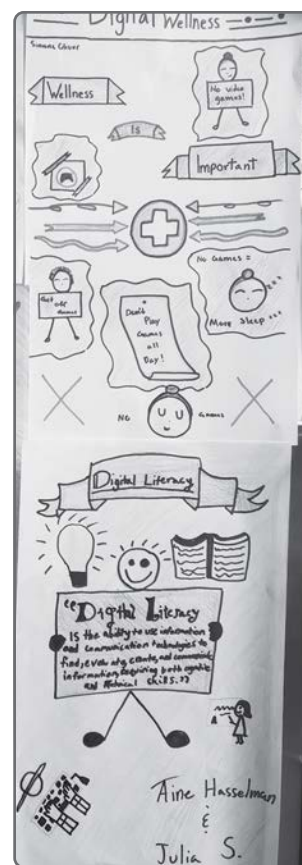
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Many web-based tools, such as Storyboard That (**storyboardthat.com**) and MakeBeliefsComix, make it easy to get started. Storyboard That also provides lesson plans and templates for you to use. When students create, they can present to the class as a slideshow or download the comic with the text below (**FIGURE 4.4**). Using Book Creator (**bookcreator.com**), students can write and publish a digital book that includes text, images, audio, and video. With Storybird (**storybird.com**), students can create a book full of artwork and choose from hundreds of themes to match their story. These Storybird books can also be purchased in softcover or hardcover formats. I have many student-created books in my classroom and use them to provide more authentic reading opportunities for their fellow students each year.
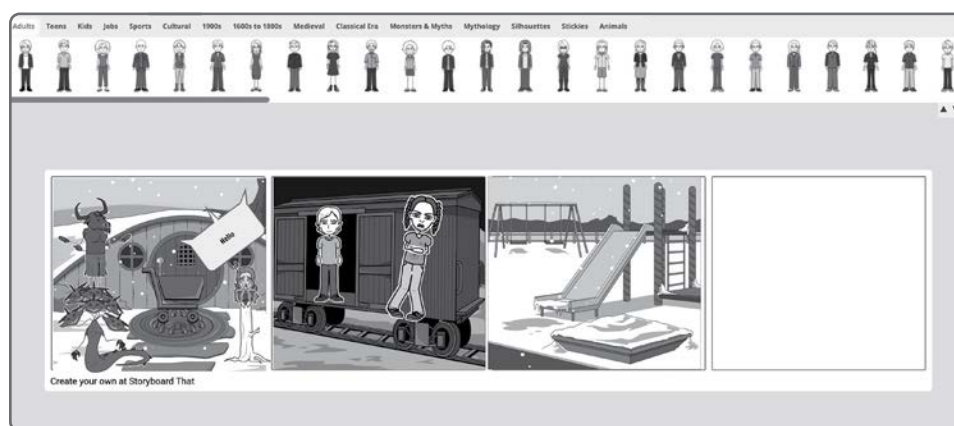
FIGURE 4.4 Student view of panels and options when creating in StoryboardThat

Infographics

Infographics offer a lot of options for students to create any type of presentation for any content area and grade level. Highly beneficial for students who are visual learners, the use of infographics as representations of student learning and also as a means to deliver instruction promotes more collaborative learning. There are many uses for infographics: sharing results for project-based learning, creating a timeline, designing a family tree, explaining a process, providing instructions, and more. When they create a presentation, students also develop other vital skills such as learning about design. You can also address each of

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the ISTE Standards for Students with the use and creation of infographics. As students create, they must decide which tool will enable them to represent data, display information, show ideas, explain concepts, and present to a variety of audiences while building digital citizenship skills through respectful and responsible use of digital tools. Students can work collaboratively with peers or on a global scale to create infographics and share their learning.

Using infographic tools, students can design graphics that are creative, individualized, and demonstrative of their learning. The variety of fonts, themes, images, and other features within the creation tools enhance visual thinking skills and spark curiosity for learning. In my classroom, we have used several tools for creating infographics, including Adobe Spark (**spark.adobe.com**), Buncee (**app.edu.buncee.com**), Canva (**canva.com**), Piktochart (**piktochart.com**), Smore (**smore.com**), and Visme (**visme.co**). Depending on the purpose of the infographic, each of these has uniquely useful features (**FIGURE 4.5**). Getting started with any of the tools is easy, and students enjoy creating something personal to them and their interests. See additional examples of how students used these tools for their class projects by scanning the QR code at the end of the chapter.

FIGURE 4.5 Two infographics students created using Piktochart and Buncee
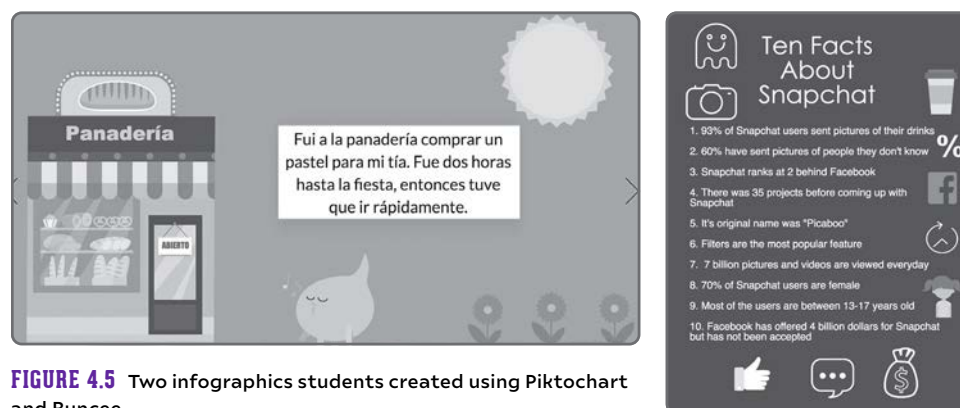
Creating Learning Journeys

As a way to help students connect more with content, they are frequently told to simply "imagine:" Imagine what it would be like to live in a different place, have a certain job, visit a famous historical landmark, go to school in Europe, interact with a person from history, or do something adventurous or scary. We

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want students to explore more deeply and make connections with the content they are learning in more meaningful ways—and now they can do more than imagine. When we can purposefully leverage such emerging technologies as augmented reality (AR), virtual reality (VR), and artificial intelligence, we can immerse students in a world of memorable and innovative experiences. By immersing students in different worlds through AR or VR, we encourage them to negotiate meaning and develop their own understanding based on their personal interactions. Being able to take students around the world, to bring in learning opportunities that were previously impossible or hard to access, will amplify students' learning potential. The following sections, as well as this chapter's "5 to Try" section, take a closer look at some activity ideas and the tools you can use.

Virtual Field Trips

Students love field trips; just the idea of exploring somewhere beyond the physical classroom space is enough to excite them. With tight budgets and lack of resources, however, frequent field trips may be close to impossible for some schools, especially if the destination is to another part of the world. Regardless of the grade level or content area, apps and online tools now enable students to more fully explore the places they are learning about. Students can go on a virtual tour or adventure right from their classroom or wherever they are. Just think of the possibilities:

- Have students create a scavenger hunt by searching for Google Street View (**google.com/streetview**) images. Previously unreachable landmarks or far-away countries are now possibilities for explorations.
- Use Google Expeditions (**edu.google.com/products/vr-ar/expeditions**) to guide students on tours around the world or explore from below the sea into outer space (**FIGURE 4.6**).
- Create a tour for students based on the content covered or have students create their own tour, to tell a story or narrate an event. Google Tour Creator (**arvr.google.com/tourcreator**) is a great, free option, and it places students in the lead so they become the creators and not just consumers.

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FIGURE 4.6

Guide view of a Google Expeditions tour showing scene and accompanying script with various levels of questions
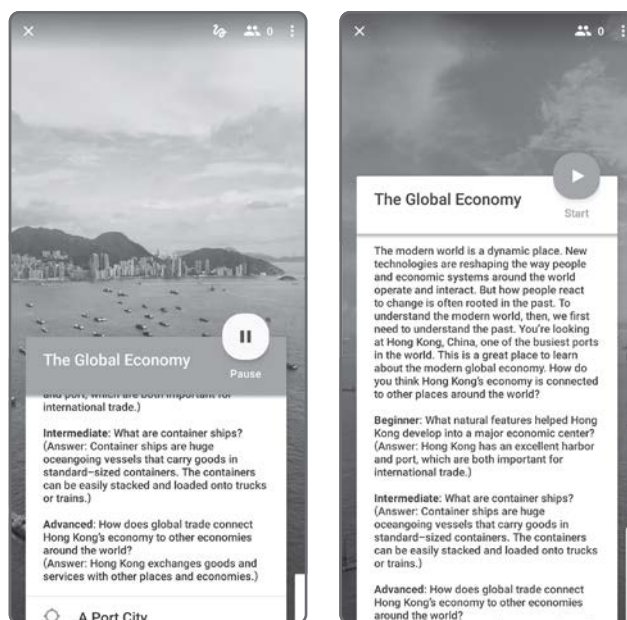
educator stories

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In an era of digital devices, many students have an opportunity to learn with AR and VR technology. Digital technologies can now transform textbooks into interactive ebooks. Virtual-reality-based experiences can instantly transport students across continents, and complex functions and mechanisms can be visualized with interactivity. VR allows students to interact and experience in a dynamic and engaging way. Most students learn by doing. VR provides an experience to anchor instruction paired with new learning modalities. With VR, students are inspired to discover and create for themselves. Students now have an opportunity to learn by creating things, thus transforming the way educational content is delivered and received. The potential and promise of augmented and virtual reality connect students with people, places, and experiences they would typically be unable to access.

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Close Explorations with AR and VR

What would it be like to hold a frog in your hand and explore it without actually needing the frog? How about creating a scene from a book or designing a house and being able to hold and manipulate it in your hand? Courses all have some content where students could benefit from actually holding the object and being able to explore on their own. In geometry class, I struggled with figuring out angles, proportions, and working with the different shapes. Now visual and kinesthetic learners like me have access to AR and VR tools for manipulating these 3D objects virtually, which enables students to attach more meaning to what they are learning. There are so many possibilities for creating using these AR and VR tools. Although traditional manipulatives from toothpicks to marshmallows to modeling dough still have benefits for designing a project, students apply more skills when creating something with the emerging technologies available to them.

Rather than simply looking at an object, students can move through the layers of it. Instead of looking at photos of places from around the world or learning about animals by watching videos, students can step into those spaces and explore more closely. AR and VR tools enable us to take students to places previously inaccessible through virtual tours and 360-degree videos. When using these digital age tools, students have more control of how and where they are learning than textbooks, photos, and videos can provide. The level of student engagement will increase when students are given more personalized learning experiences. These tools enable students to make decisions, which leads to a more student-driven classroom and increases student choice, agency, and engagement. As Liz Kolb explains in *Learning First, Technology Second* (2017), sometimes tech is the way for students to focus on a task, become motivated to learn, and shift from passive to active learning.

Tools for exploring and creating in AR, for example, have tremendous potential to immerse students in a meaningful learning adventure, giving them more control of how, when and where they learn. Besides being fun to use, they offer students time to build skills in critical thinking, problem-solving,

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and collaboration, while fostering creativity. Here are a few tools that I enjoyed trying; I could not wait to see what my students created on their own:

- 3DBear (**3dbear.io**) has many possibilities for classroom use. Students can use it to create 3D objects, place them in different spaces, and then record a story to go along with it. It's great for doing a project to talk about the community, give a book summary, create a story, and more. To help you get started, the 3DBear site offers lesson plans for coding, design thinking, language arts, math, science, social studies, and STEM.
- Figment AR (**viromedia.com/figment**) enables students to create an "experience," which includes activities and different features for exploring in augmented and virtual reality (**FIGURE 4.7**). Add emojis and effects like snow, and record a video. It's a great way to get students actively learning and creating in the classroom.

FIGURE 4.7 Students creating with Figment and exploring the portals

- Metaverse (**studio.gometa.io**) enables you to create an experience of activities and different features for augmented and virtual reality. Students enjoy creating, and you can also use Metaverse to create assessments (**FIGURE 4.8**). Creating is based on a storyboard design, where students can add a variety of elements to their projects, such as videos, 360-degree images, portals, probability questions, polls, and Google Vision.

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FIGURE 4.8
Creating a Metaverse experience and designing the storyboard
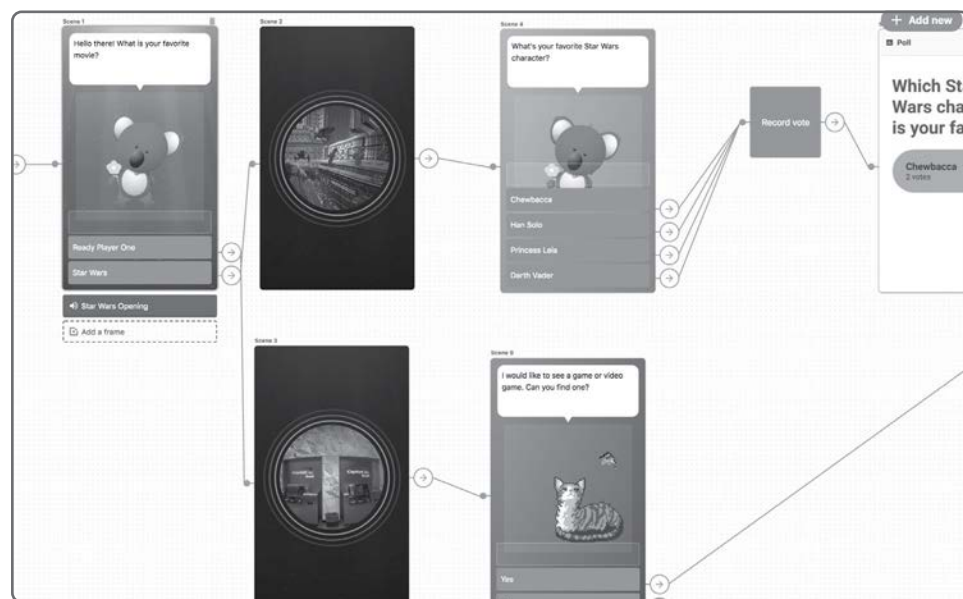
- MERGE (**mergeedu.com**) offers several options for educators to bring AR and VR learning opportunities to students. The MERGE Cube enables you and your students to hold and interact with 3D objects in augmented reality (**FIGURE 4.9**). With one of the several compatible apps, students can use it to explore virtual objects, investigate the solar system, learn about anatomy, and even record their own narrations to go along with an experience. Students can create their own experiences by using the MERGE Cube with CoSpaces Edu. To help you get started, the MERGE EDU platform provides many resources for educators, including lesson content and activity plans on various content areas and topics (**FIGURE 4.10**).

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FIGURE 4.9
A MERGE Cube seen in reality and augmented reality

FIGURE 4.10
Examples of the content available with MergeEDU
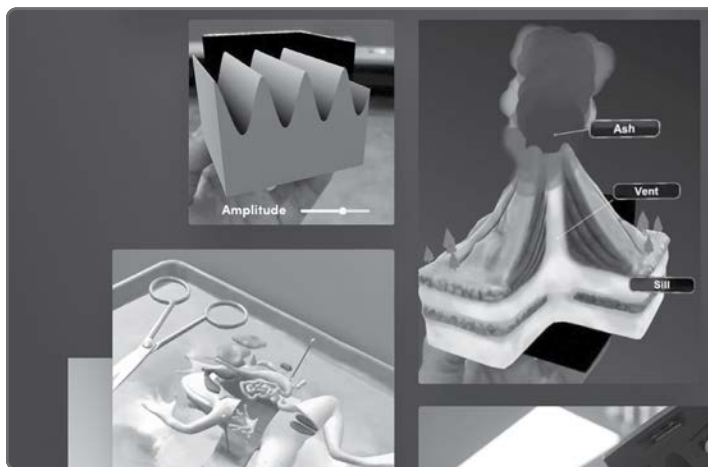
- Flipgrid AR (**flipgrid.com**) enables students to take a Flipgrid video and "place" it into the real world by using a Flipgrid AR QR code. Both you and your students would need the Flipgrid AR app. Have students create videos and place the QR code on a visual that is displayed in the classroom for other students to walk around and scan. This is also a fun way to engage families at school events!

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- Thyng (**thyng.com**) can be used to add objects into the real world. Students use an image as a trigger, or create a scene and then record the video to share. It opens so many possibilities for students to create and narrate.

Remember, the learning doesn't need to stop just because the VR or AR experience is over. You can spark more curiosity and continue to promote creativity by having students narrate a story about what they saw during their virtual field trips and explorations, building communication skills in meaningful ways. Need more ideas? Jaime Donally's website **ARVRinEDU.com** and book *Learning Transported: Augmented, Virtual, and Mixed Reality for All Classrooms* are two great resources for activities, tools, and more.

educator stories

LAURA STEINBRINK *is an English and Spanish teacher at Plato High School in Plato, MO.*

Traditionally, students might write a children's story or book and decorate the cover. As I considered that activity, I pondered available tools before settling on CoSpaces Edu (**cospaces.io/edu**). Not only did students write the stories, but by using CoSpaces Edu, they also could create the world and scenes of the story for the reader to explore. And if that wasn't good enough by itself, each story created by students within CoSpaces Edu could be shared as a link. Our stories were being read in Seattle, Washington, and Meridian, Texas. The kindergartners in Washington even made suggestions for my sophomores. Talk about the impact of a lesson! Students were more engaged in writing a story for students in another state, and they became very focused on the quality of their work, especially after the kindergarteners gave them feedback. Game changer!

App Smashing

One way to help students build a variety of technology skills while also developing knowledge of the content area is through app smashing. When we do this, we push ourselves to stay current with technology and also provide more options for our students. *App smashing*, a term created by Greg Kulowiec, is "the process of using multiple apps in conjunction with one another to complete a final task or project" (2013).

App smashing is a good way for students to build upon their skills and become more comfortable with technology. It can also help teachers become comfortable implementing tools into the classroom without the worry of

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having to take on too many things at once. The idea is that we gradually build on skills with increasing complexity, enabling us to enhance and extend learning and also move beyond using technology for simple substitution and instead, modify and redefine what we are doing. We also push ourselves to continue to grow professionally and take on the role of co-learners with our students as we address the ISTE Standards for Educators.

Using a camera is a quick way to get started with app smashing. For example, for students who may not want to do a presentation in class, suggest they use their smartphone instead. First, have them take a picture with the phone. Next, they can create an avatar using an app such as Voki (**voki.com**), then record their voice using Tellagami (**tellagami.com**) or another a talking app. Finally, combine their voice over the picture or something else that they choose. With app smashing, you can also provide options for your students to use multiple tools for the creation of an end product, whether an assessment for the end of the year or just a part of a project within a chapter or other unit.

As a foreign language teacher, sometimes I like to have my students find or take pictures and then narrate a story by taking photos and using Padlet (**padlet.com**) or a similar a tool to display their pictures, upload them into Buncee on their phone, or create an augmented or virtual reality experience to explore. The progression from one tool to another helps students build multiple different skills while they're doing this.

student stories

LOLA ABRAHAM *and* **GEORGIA TSAMBIS**, *eighth-grade students from my STEAM course in Oakmont, PA, worked together to contribute their perspective.*

We like to have choices in digital tools because it helps us create something different than our classmates. There are always options that make it easy to get started with and everyone can be creative. For science, English, history, or whatever the class, we can use the options to share what we know in words, but we can also use images, video, and audio instead and demonstrate a concept or a scene rather than relying on a plain slide or using too much text. Choices make it more engaging for us when we are watching the presentations, and we learn even more. Using tools like Buncee and CoSpaces makes it more interactive for us, and we can build more skills, be more specific, make stuff, add extra details, and get a better understanding of the material. Students will learn more, and it helps with teaching because this reinforces what we are learning in more ways that matter to students and represent their interests too.

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App smashing is a simple way to build tech skills and address the ISTE Standards for Students: Students are Empowered Learners because they make decisions about what they are using and how they are creating. They practice being Digital Citizens by building and showing their knowledge in the digital world. They are Knowledge Constructors and locate information and produce a meaningful representation of learning. As Innovative Designers, students have choices of technologies and tools to use for their design as they create innovative work. They are Computational Thinkers because they are trying to decide how to best represent their information. Students are Creative Communicators and use various tools to share their knowledge with a variety of audiences. And finally, by collaborating with other students or connecting with other classrooms, students expand on their own experiences and perspectives and become Global Learners. App smashing also benefits our work as educators while we collaborate and as we learn with and from our students and build our own skills in the process.

Lesson Flows

Some educators choose to do a lesson flow, which is similar in concept to app smashing. A lesson flow involves multiple components where students engage with the content and then extend and explore their learning in different ways. For example, you can provide students with a short video to watch, follow up with a game-based learning tool or some other form of assessment, or even incorporate blogging or video responses. Students work through and complete tasks using various tools, their efforts culminating with the creation of an interactive lesson, infographic, or something else to represent what they have learned. The idea is to help students build skills at their own pace while meeting their interests and needs. Learning done in this way affords you the opportunity to work with each student and learn about their interests, while giving them a chance to drive their own learning and promote student agency in learning. Examples to start with include Quizlet (**quizlet.com**), YouTube videos, Educreations (**educreations.com**), Padlet, and Nearpod (**nearpod.com**).

Getting Started: Take the Risk

Students can experience learning through these tools as consumers, but they need to spend more time being the creators. For educators, deciding which

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tools to use sometimes comes down to a personal choice based on your comfort with technology. The array of choices can be intimidating to think about, however, and you may feel like you have to know everything about them before beginning. A common concern is that students might ask questions that a teacher cannot answer. Don't let this stop you. We cannot possibly have all the answers, and it serves our students better that we don't. Some students learn new skills quickly, and we want them to problem solve and push through challenges in learning too.

Sometimes we need to take risks and use tools that may not be considered traditional in our content area, but that might just be the perfect way to hook students into the lesson more. Here are some ideas for getting started:

- Set aside time to get to know your students, ask about their interests, and then step aside while they create on their own. Learn from them and be okay with having them take the lead.
- Set goals for yourself to try new tools and share your experience with students. Model the learning process by openly embracing challenges and failures and involve students more in helping you learn too.
- Pick just one tool to start. There are so many options that it can be overwhelming. Select one of the ideas mentioned in this chapter and see what happens. Each of the tools discussed has content available—ready-made tours, sample lessons, etc.—so you can get started quickly.

By using different methods and innovative tools, we can co-create experiences that will engage students more in learning, increase motivation, and enhance their learning journey.

lessons learned along the way

When I attended my first ISTE conference in 2015, I presented a poster session on the digital tools I was using in my classroom. I remember speaking with a woman who stopped by, sharing some of the projects that my students had done and the activities we were doing in class, and she told me that I was app smashing. I wasn't quite sure what she meant, but as she explained, I realized that what I had been doing in my classroom was actually something that was recognized and used by other educators. Despite my doubts about the methods I was using, I discovered I was engaged in a practice that proved beneficial for student learning. That conversation led me to begin taking more risks in my classroom and replaced my prior uncertainty with some validation, which is what I needed in order to keep making a difference in how I was teaching.

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5 to Try

As educators, we want our students to have a learning "experience" beyond what the traditional methods of classroom instruction might offer. Finding time to create and explore can be a factor in deciding where to begin, but with the right tools, it's easy to get started, especially when we let students take more control. Here are a few versatile tools and some ideas for using them. They each offer many options for classroom use as well as examples to help you get started right away.

1. **Nearpod.** Nearpod (**nearpod.com**) is the tool I used when I first started using virtual reality in my classroom. My students were able to explore the places they were studying, and it increased student engagement. Nearpod offers many virtual tour choices from around the world as well as 3D objects for students to explore; both serve as great hooks for a lesson. The content of Nearpod goes beyond the VR focus, but it's a great way to get started quickly and see how students respond. It's also a wonderful tool for app smashing and for station rotations in class. Use it to promote digital citizenship, digital storytelling, and exploring global issues.

2. **CoSpaces Edu.** CoSpaces Edu (**cospaces.io/edu**) is a virtual reality tool that empowers students as creators and offers many options for creating spaces (**FIGURE 4.11**). Students need to learn to collaborate, and within the CoSpaces Edu platform, students can work together in a group. Ask students to create a biome, tell a story, explain a concept, make a game, or just build something unique to explore. It promotes creativity and helps build skills such as digital citizenship, SEL skills, critical thinking, and problem-solving. Using tools like these offers more authentic ways for students to demonstrate learning while having fun in the creation process. Students learn to respect one another's work and see the power of collaborating in live time, just like with Google or Microsoft tools.

student stories

CASSIDY HUNTER *is a high school senior in Plato, MO.*

Last year during Spanish I, we used CoSpaces to make a model of our town for students in Spain and Argentina. The entire class was able to work on the same virtual map, and I appreciated the chance to collaborate with the rest of my classmates; I was new to that class during the spring semester, and this project was a great team-building activity. I genuinely enjoyed using CoSpaces, because I thought it was fun learning how to manipulate the 3D objects in our virtual creation, and it was cool to be able to scroll across the map and see what everybody else was doing.

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FIGURE 4.11
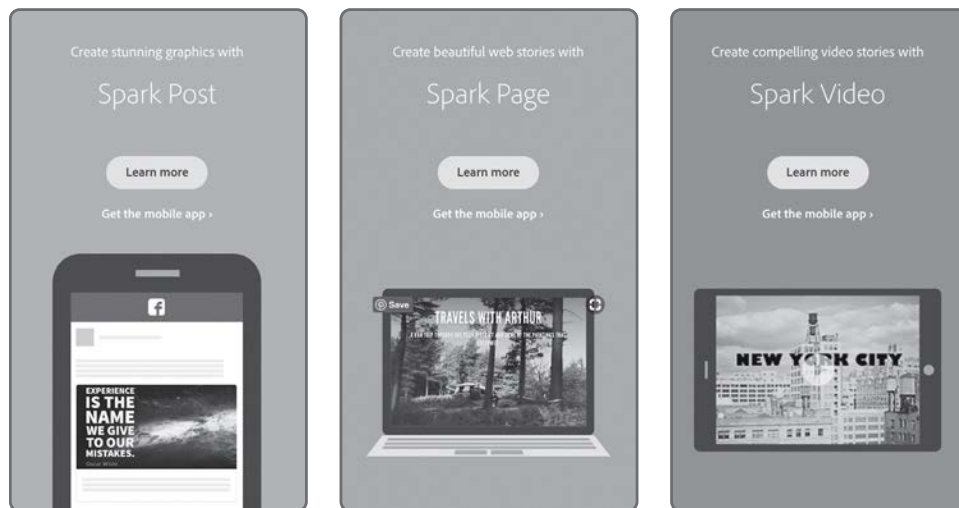Students creating in
CoSpaces and exam-
ple scene created

3. **Video Lessons.** An idea that has worked well with my students is the cre-
   ation of video lessons, which can be used in the classroom or shared with
   students who are looking for additional practice. While students plan their
   process, experience the power of using video for communicating ideas, and
   decide how best to convey their information, they are also learning import-
   ant communication skills that will no doubt benefit them in the future.
   Some options would be for students to create a screencast, deliver a short
   talk about a specific topic, or teach and record a lesson for other students in
   the class to use (**FIGURE 4.12**). Some digital tools to explore are WeVideo (**wevi-
   deo.com**), Educreations (**educreations.com**), and iMovie (**apple.com/imovie**).

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FIGURE 4.12
A student-created cooking show to discuss food and recipes in Spanish

4. **Infographics.** Using infographics, students can learn to sort through information and find the best ways to represent data. Educators can address many of the ISTE Standards for Students by having students create in this format using such tools as Adobe Spark (**spark.adobe.com**), Buncee (**app.edu.buncee.com**), Canva (**canva.com**), and Piktochart (**piktochart.com**). Infographics can also be a unique way to present an interactive lesson or for blended learning (**FIGURE 4.13**). By including hyperlinks within the infographic and directions for students to create their own, you can increase the level of interaction with the content, and the infographic becomes a new way to deliver instruction.

**FIGURE 4.13** Options available for creating with Adobe Spark

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5. **Talk and Share.** Using tools for facilitating asynchronous discussions or creating videos or other animations are some of the best ways to promote student voice and to encourage students to share their thinking and their learning with others. Keep in mind potential issues with student access to the right devices and offer multiple options so students can choose what they need. Such tools as Animoto (**animoto.com**) for short videos, GoSoapBox (**gosoapbox.com**), Socrative (**socrative.com**), or VoiceThread (**voicethread.com**) encourage students to share ideas and respond in either written format or post a video (**FIGURES 4.14** and **4.15**). With Wakelet (**wakelet.com**) and similar tools, students can add resources, upload a video response, and curate all materials in one space (**FIGURE 4.16**).

FIGURE 4.14
A discussion started in GoSoapBox

FIGURE 4.15
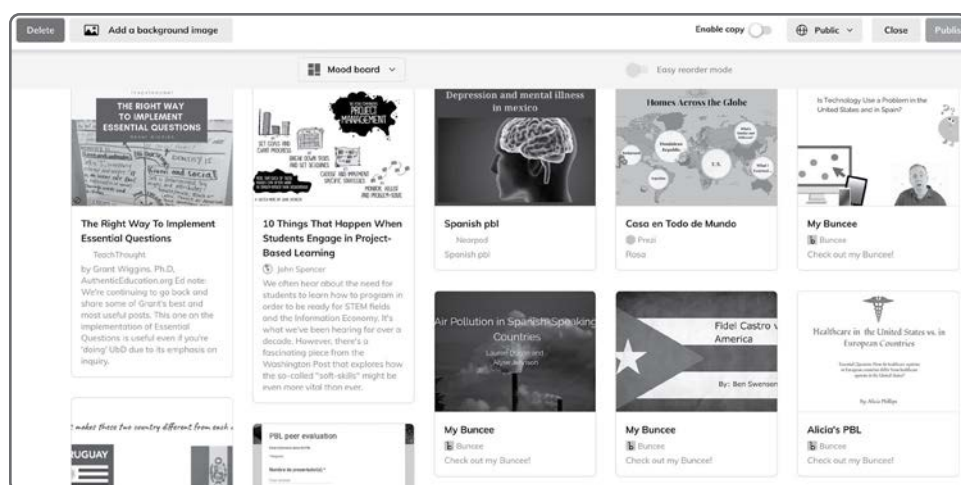Options for activities to use within Socrative

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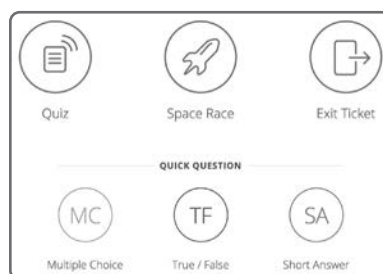
FIGURE 4.16 Wakelet used to share PBL resources and projects
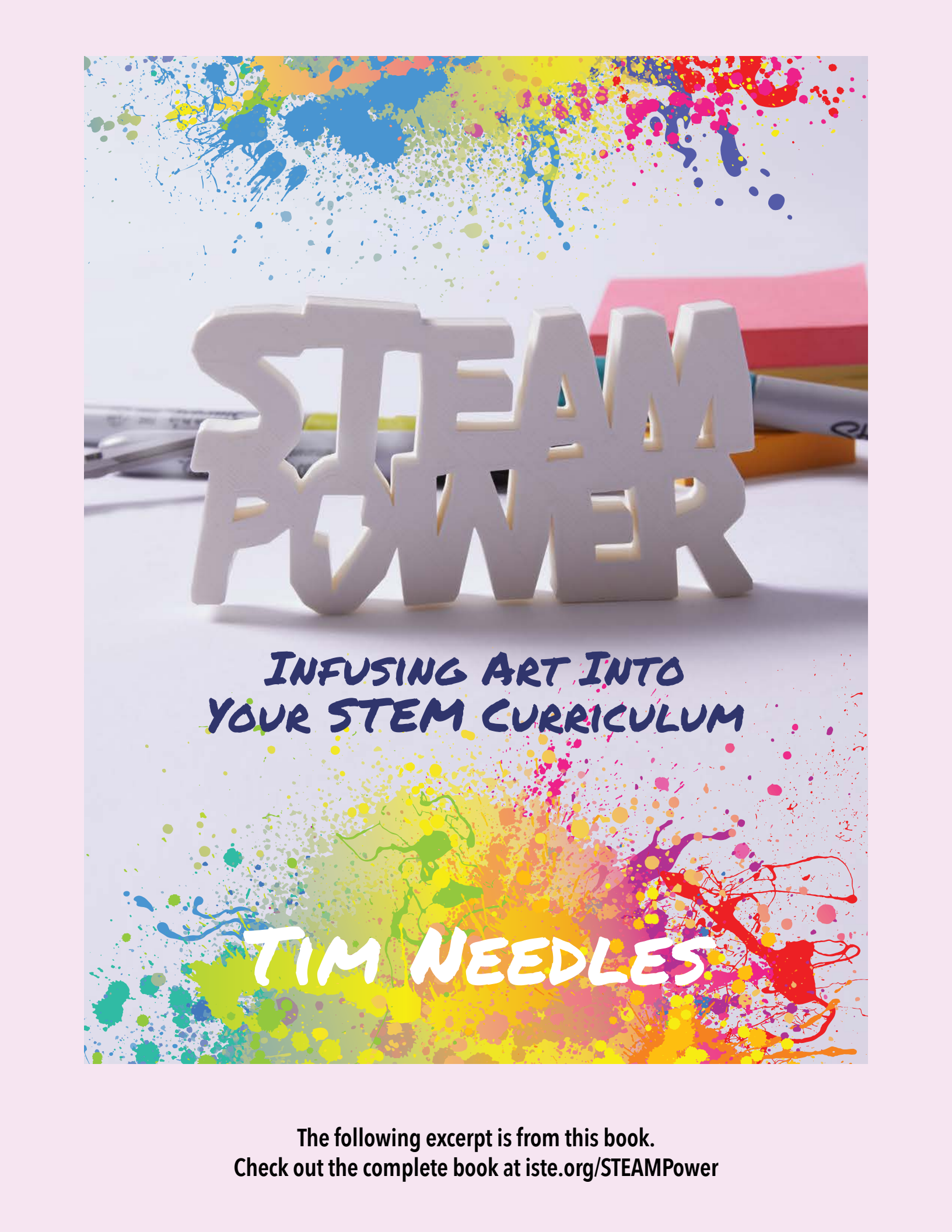
Questions for Reflection

- In what ways have you had students share their learning? Are they following a specific outline or template for what to create, or do they have options for creating on their own?
- How can lesson flows or app smashing enhance your teaching practice?
- What are some ways to encourage colleagues to explore these new ideas?

Tools and Resources

Let's continue our learning journey together: Choose one of your answers to share on Twitter using the hashtag #ChartYourNewCourse, or share some of your new ideas for ways to use the techniques and tools discussed in this chapter. You'll be helping create more resources for all of us.

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STEAM POWER

Infusing Art Into Your STEM Curriculum

Tim Needles

The following excerpt is from this book.
Check out the complete book at iste.org/STEAMPower

CHAPTER 12

Connections

…………………..

Connecting with others is one of the most powerful things we do in life; it unites us. Making connections is important for all educators, but it's essential for STEAM educators. By its nature, STEAM is collaborative, and connecting with others is necessary to stay updated on trends and developments. Great educators often have many strong connections; we as educators depend on one other and on our connections with people in our industry to keep our teaching relevant.

When you can connect STEAM learning with other disciplines, schools, and educational environments, it becomes more meaningful and memorable, but it doesn't need to stop there; reaching out to professionals can lead to lasting partnerships and directions for learning that we may have not envisioned. Many STEAM professionals from large companies, universities, and corporations make themselves available to educational groups and can give students a first-person perspective. You can make connections with these professionals through resources such as Commonwealth Scientific and Industrial Research Organisation (CSIRO), National Geographic Education's Explorer Classroom, and Hour of Code. Conferences, symposiums, and STEAM events are also great opportunities to connect. Professional social media accounts can be helpful; on LinkedIn, Twitter, and Instagram,

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Making connections across disciplines allows learners to view any unit of study from different perspectives while uncovering its complexity and depth.

I have connected with fantastic people who ended up being great assets in my teaching.

While these connections are valuable for students, they can be even more so for educators because they can help us learn what new areas and technologies to pursue. STEAM is not a static curriculum, so effective STEAM teachers must follow innovations and adapt their curriculum with regularity, especially when it comes to addressing technology that is continuously developing.

Sharing Success

Great learning is not enough to build a terrific STEAM program. Sharing that learning and its successes has become a necessity, and outreach also builds connections and creates opportunities you might not otherwise have. A strong STEAM program should communicate regularly with the school body or institution, the local community, and the worldwide STEAM community. The role of a teacher may start in the classroom, but it should spread through the community to be successful. If you take for granted that the wider audience understands why STEAM learning is important, you may miss an opportunity to build advocacy and understanding.

Great STEAM teachers need to share the positive things their students do in class, whether it's asking interesting questions, being a good collaborator, or even going back to the drawing board after a tough failure. Promote students for doing well but also for failing well, learning from

their mistakes, and not getting down on themselves. Model the behavior and share your own successes and failures and how you learn from them. This modeling should be framed as a teachable moment so students can see what you were attempting, why you failed, how you learned something from reflecting on the failure, and most importantly, how you incorporated that learning and made a new attempt. This personal sharing builds trust and teaches an essential lesson on how to reflect and persevere.

New teachers might be apprehensive about personal sharing like this, but it can be beneficial and prepare you to face any fears you might have. Occasionally, students might see your failure as a weakness and challenge you on something you shared, especially if it is early in your relationship; a challenge such as this is often just a test, so react to it calmly and add context about the failures of well-known STEAM leaders and how they persevered. In other words, reframe the challenge.

Social Media and Engaging Professionals

Social media is one of the easier ways to share and it has been a game changer for educators, especially in STEAM. It allows us to connect as colleagues and to share and learn from each other regularly. Sharing our work on social media extends the reach of the classroom to the world, and you never know who is going to see it. It helps to include the context about what was being learned and why it was important when sharing work to make a bigger impact. Connections made on social media can develop into meaningful relationships with professionals that continue to benefit students and educators for many years.

Many key individuals developing and using STEAM are also present online, so it's possible to connect with them and develop a greater awareness of the field. Major players accessible on Twitter, Instagram, Skype, and LinkedIn will occasionally connect with classes and play a role in projects. A project such as the STEAM trading cards (Chapter 6) can be shared on social media with the professionals portrayed on the cards, opening the door to communication with them. Sharing a project in this way can help it become more engaging and powerful and help inspire others.

Social media is constantly in flux, but that offers an opportunity for educators and learners because it is still very accessible. From an educator's point of view, this technology requires some planning because you need to consider your learners' responsibility level as you choose the way they'll communicate. And whether you have a class account, a teacher account, or your students are interacting on social media by themselves, review the media literacy guidelines before you get started.

STEAM Career Exploration

An expanding variety of careers involve STEAM. Exploring trends in how the STEAM job market is evolving and diversifying can give both educators and learners a better idea of what to expect in the future.

Some occupations have obvious connections to STEAM, such as physicists, video game designers, and roboticists. The role of STEAM may be less obvious in others, such as fashion designers, ultrasound technicians, automotive engineers, or dietitians. For example, it might be clear how a dietitian would use math and science, but less obvious how they would interact with engineering, art, or technology. However, anyone who's been on a diet knows creativity is a major component of designing recipes and preparing food. This is an art form that continues to expand into the STEAM landscape with new trends such as molecular gastronomy, health apps, and assistive technology, and more accurate, multifaceted scales which make technology and engineering part of the new norm in the world of diets.

It's always a great project to research the ever-changing job market and the STEAM education requirements of different careers. Parents and colleagues who have or had jobs in the STEAM fields can be great resources. I've asked students to research careers and then team up to find local professionals in those careers, and it's led to some lasting connections. Students can share what they learn about STEAM careers with the school, organization, administration, and community to educate them and also to advocate for STEAM education.

There's still a perceptual divide between technical knowledge or "know-how" and skill sets that are traditionally known as "creative" ones. I encounter that even now in the work that I do within NASA Ames Human-Computer Interaction and in academia too. It's challenging because you almost have to be a little bit of both in order to foster the conversations and do the interdisciplinary work that's actually meaningful and transgressive and that gets the attention of subject matter experts in each discipline.

Virtual and Real-World Field Trips

Field trips to see how STEAM works in the real world can be amazing learning experiences for everyone involved. The trips, which can be done in person or virtually, can inspire project ideas, give educators and learners ideas about areas to explore, and introduce emerging technologies that might be interesting to use in class.

In-person field trips generally make a bigger impact and can develop from the kinds of connections we discussed in the previous section. If it's too difficult or costly to take students on a field trip, a great alternative is to bring local STEAM professionals into class. This kind of interaction can take a bit of organization, so it often makes sense to widen the scope. You can invite a few STEAM professionals to talk in a larger discussion to make the experience more of an event.

If in-person visits aren't possible, video conferencing technology allows for interaction to happen virtually, regardless of the classroom's location in the world. The technology is free and accessible as well as adaptable to nearly any circumstance. Remember, nothing brings home the point more than seeing some amazing STEAM work happening in action.

Working with Professional Makerspaces, Maker Fairs, and Museums

Professional makerspaces and other STEAM work centers are becoming more numerous in communities around the world, and they often have outreach programs for schools and the community. Bigger cities usually have multiple makerspaces and STEAM labs; these might have different focuses, so some research might be required. This is another area where connections come in handy, so be sure to check with other educators and professionals before researching from scratch.

Maker or STEAM fairs are another way to find connections, resources, and information. There are major name-brand fairs for makers as well as local grassroots fairs; both are great for finding new collaborators and learning new technologies, and they can showcase the work you're doing in the classroom with students. You can also create your own maker fair to develop a program closer to home that benefits the community.

National and local museums often have programs that cater to education and teachers. In addition to facilitating connections, many have educational programs that familiarize teachers and students with all they have to offer. I have found great books, videos, and items that have aided my teaching, plus a plethora of online resources such as 3D scans of objects,

Teacher Tip
Ashley Naranjo

. . . .

As more museums provide access to their digitized collections and offer opportunities for online chats with historians, scientists, and other experts, classrooms are now connected to more resources than ever before that can serve as the building blocks for these authentic learning experiences.

VR field trips, and scanned original documents that have added authenticity and engagement to our learning.

Conventions, Conferences, and Symposiums

Professional organizations offer conventions for every subject taught, but I find the best conferences mix different subjects and focus on bigger issues. ISTE hosts several gatherings, including the Creative Constructor Lab, and its annual national conference is an amazing place to connect to like-minded educators. Groups such as the Association for Supervision and Curriculum Development (ASCD), Future of Education Technology Conference (FETC), and CUE also run focused conventions as well as large national conferences.

Smaller conferences have their place too. Those that focus on STEAM might offer fewer connections than the big events, but those highly specialized contacts may be even more helpful. Regional gatherings are important for educators who have financial or geographic limitations. Even unconferences and college symposiums can be great places to get and share information and make lasting connections.

Technology is an ally for educators with limitations because even if you can't attend a conference, you can follow those who do through hashtags on social media. Another increasingly available option is virtual attendance at conferences; technology-aware associations such as ISTE now allow participants to watch presentations and interact from home.

Navigating the World of Educational Technology

Trying to figure out which educational technology works best for you and your learners can be overwhelming. The world of technology moves quickly, and new tools come out all the time. Keeping up can be stressful, especially

for new teachers or educators who don't regularly integrate technology. Educators don't want to miss out on anything that could be beneficial to their students, but they might have a hard time knowing which tools are valuable.

Here's my advice: organize your search, find trustworthy colleagues who regularly share valuable tools, and work with your professional learning network. You're not searching alone; many other teachers are sorting through the same technology you are, so working together is beneficial. It may not always be clear whether a tool is beneficial if you don't know how to apply it, so it's valuable to hear how colleagues are using the tool. I find the majority of my new technology tools through conferences, maker events, and social media, but I come across so much technology that I might not recall it later, and I've learned to keep notes with pictures. These notes are essential for me because they allow me to revisit the tools when I have more time to learn about them, or when I'm searching for a tool to use in a lesson.

The benefit of conferences and events is that you can often have a hands-on experience with the technology. That gives you greater insight into how it works and might function in your teaching. The strength of social media posts from other educators is that they may have used it in the classroom, and they may include lesson or project ideas. Be aware that some educators posting edtech are not sharing for the sake of sharing; some are paid by companies to be influencers or are supported in other ways that are not immediately clear. This is not to say you shouldn't be open to what they're sharing, but it's something to consider in your decision making. This is one of the reasons I suggest having multiple sources for your edtech tool contacts on social media; collecting more perspectives tends to offer more solid leads.

Tools that are right for one educator, however, may not serve the needs of another. Experiment to see which tools are right for you. I avoid certain technology tools because of privacy issues; others may be too costly or diffi-cult to integrate into the computers and lab I have. Decide what works for you. I think of educational technology the way I think of music: just because something is at the top of the chart doesn't mean I'm going to like it, and conversely, I may love something that's not charting at all. You never know.

Online Connections

When you connect online with other people, it's important to be clear and courteous. Context is crucial in what you're communicating, and when something is implied but not specifically stated, misunderstandings can occur. Different generations and cultures have different norms and expectations. Younger learners, for example, may use some abbreviations and vocabulary that can be confusing to older people. When my parents bought smartphones and we began texting, they didn't understand memes or common phrases such as "LOL," so I had to explain them. Be conscious of the language you use in online interactions and lean toward clarity. The most common online miscommunication often occurs with humor, sarcasm, and idiomatic phrases, because those don't always translate to other places or cultures. Start slowly and make conversation before diving in too deep. In online communications, there is a tendency to cut to the chase, but it can come off rude or overly assertive.

Teacher Tip
Robert Fish

When you put people together for a conversation online, it's just like it is in person: you have to start with some normal social interactions to break down barriers and get people comfortable with one another. You can't just jump into deep questions. Once you let people get to know each other, even superficially, it allows you to get to deeper interactions.

Preparing for an Unknown Future

We cannot predict the future. Educators can use the past and the present to project what to expect for students, but it's not a perfect science. If we base our assumptions on the increasing speed of technological change and continued automation, we can forecast that future careers will be vastly different from those of today. So how do you prepare students for an unknown future? How do you navigate educating students for future occupations for which we likely don't yet have names? Do we try to make our best guess?

If we do, we will likely be wrong. Look at the past: there are a handful of surprisingly accurate predictions, but most depictions of what the future would be like are wildly inaccurate. A wiser approach is to build skills that we know are useful, such as those outlined in the ISTE Standards, update our information regularly, and strengthen students' abilities to be creative, flexible, and innovative. This approach pairs naturally with STEAM learning and works in tandem with it. It's important to occasionally step back and examine the curriculum to be sure this is all being reflected in the projects and assignments. Teachers often lean toward one discipline or another and sometimes grow too comfortable in what they teach, but it's vital to make sure students are getting a well-balanced, modern STEAM experience.

When I was in middle school in the 1980s, my teachers predicted computers were going to be the key tool of the future. They were correct. But the way they chose to prepare us to work in this new computer-centered world was with keyboarding classes. In retrospect, it was not the best skill set to build, but I understand why they chose it. At the time, keyboards were the new technology, replacing punch cards and other computer input methods, but being an amazing typist today doesn't give anyone a huge edge in the digital world. In truth, keyboards themselves now seem antiquated as devices evolve, touchpads grow more dominant, and voice controls become more ubiquitous. I can envision keyboards disappearing in the next ten years.

I don't fault my teachers for not preparing me fully for the digital age. As an educator, I understand how easy it is to base your teaching on present circumstances. Knowing how quickly technology moves, I can't even guess

where it is going, but I can foresee some of the necessary skills. Many of the most essential skills are reflected in the ISTE Student Standards and the Framework for 21st Century Learning. In addition to those skills, educators must help students learn the power of adaptability because it will likely be a requisite of any future occupation.

Jobs Without Titles

In education, there has been an ongoing discussion about how to prepare students for jobs in an unpredictable future, but the scenario also applies to education itself. The world is becoming more automated, and it has affected nearly every occupation. I think we can see this trend continuing, but we also must consider what other consequences come with it. Social and emotional learning becomes a factor here because it is not enough to simply prepare students for STEAM careers; educators should also help those students develop the skills and ability to adapt and persevere so they can exist happily and successfully in those careers.

When I began working as a teacher more than twenty years ago, the job appeared predictable and secure; teachers learned the curriculum and taught it their whole career. But that approach doesn't work today. Shortly after I started teaching, the duties and expectations of a teacher began evolving and changing. I helped introduce more computers into my school, and they quickly replaced all the analog equipment. I was able to learn and adapt in part because I worked with students as partners in experimenting and innovating with the new tools. Many of those students I worked with benefited from our partnership, went on to become masters of those emerging tools, and now have amazing professional careers. I make it a point to continue our communication in part because of the bonds we built, but also to keep the learning with my current students relevant.

Alumni can be an amazing resource, and social media allows for a direct connection. These relationships help inform students about potential occupations and industry trends and expectations. Fostering communication between alumni and current students has had numerous benefits, some of which were unexpected. It is terrific to be able to celebrate the hard work

and success of former students, but the interaction also helps current students understand the value of a strong work ethic and the unpredictable nature of the job market. We discuss not only the successes but also the failures as they sometimes teach a more impactful lesson.
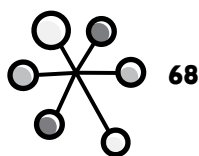
NEW REALMS FOR WRITING

Inspire Student Expression with Digital Age Formats

MICHELE HAIKEN

4

Poetry
Traditional, Visual, Makerspace

Excerpted from Chapter 4, "Poetry: Traditional, Visual, Makerspace."

Visual Poetry Projects and Movie Making

Students need to read poetry if they are writing their own poems. An excellent tool for literary analysis and close reading exercises, poetry uses vivid language that paints a picture in the reader's mind. When my students are introduced to Shakespeare's sonnets, for example, we read many in class together to understand Shakespeare's language, meaning, and tone. I then divide students into small groups and assign each a sonnet for the Five Frame Photo Story activity: Students read, interpret, and summarize the sonnet in five original photographs. Using only images, students must showcase the main idea presented in the sonnet. When language is complex, visuals are helpful to support comprehension, thinking, and meaning making. (For more discussion of the Five Frame Story activity and its originator The Jacob Burns Film Center, see Chapter 2 of *Personalized Reading*.)

Another visually appealing poetry video project is The Sonnet Project from the New York Shakespeare Exchange. This organization is working to produce videos of all 154 of Shakespeare's sonnets. Each video highlights a specific location around the five boroughs of New York City as professional actors dramatize a sonnet. (The organization is now sponsoring international and U.S.-based versions of this original series, as well.) After viewing three or four different videos, my students and I discuss the visual choices the directors made to help viewers understand the meaning and interpretation of the sonnet. I then assign students a sonnet so they can create their own movie that visually showcases the sonnet's true meaning and key ideas. To help students analyze the sonnet and plan their movie, I give them a graphic organizer that breaks down the project into smaller parts and scaffolds their thinking. Some of our learners need this type of scaffolding for making meaning out of poetry, whether with complex texts like Shakespeare or a standard poem.

I present the graphic organizer shown in **Figure 4.2** to help students peel back the layers of Shakespeare's sonnets. In class, this would be an I Do, We Do, You Do lesson where I first model a close reading of a sonnet. I think aloud in front of the class, sharing my questions and inferences about the sonnet.

Excerpted from Chapter 4, "Poetry: Traditional, Visual, Makerspace."

I might annotate the sonnet displayed on a SMART Board or under a document camera so students can see my interaction with the sonnet, as well. Then, I post another sonnet on the board, and together we read it aloud and examine it closely, trying to make sense of Shakespeare's words and meaning. This is an opportunity for students to articulate their questions and meaning making. We might reread the sonnet multiple times or chunk it into stanzas to summarize, outline, and synthesize. Lastly, I give students in small groups or independently a third sonnet to try on their own. This teaching formula is a gradual release for students becoming independent thinkers and readers of complex text.

For my ELL students or students with learning differences, I sometimes include a word bank with definitions under the sonnet. Additionally, I might ask them to draw a picture of the images that come to their minds as they are reading. Visuals are helpful for many learners. Resources, such as SparkNotes' No Fear Shakespeare site offer modern English translations of Shakespeare's texts that students can access for better understanding.

The most challenging aspect of Shakespeare for students today is his language. When students read Shakespeare, they often struggle to make sense of what he is saying because it is almost a foreign language for many. One way to help students to make sense of Shakespeare's language is to show them a few Pop Sonnets, which turn popular songs into Shakespearean sonnets, and have them figure out what contemporary song the sonnet is channeling. Pop Sonnets can be found on the Tumblr page popsonnet. tumblr.com or in Erik Didriksen's collection *Pop Sonnets: Shakespearean Spins on Your Favorite Songs* (2015). Similarly, in the *William Shakespeare's Star Wars* series of books, Ian Doescher depicts George Lucas' epic movies in Elizabethan English. These are fun to read or listen to and inspire students to think how they might remix one of their own favorite tales and transform it into a sonnet or poem. For these remix and Pop Sonnet assignments, I do *not* require students to write in Shakespearean English but do require students to modify the language to follow the sonnet rhyme scheme. An assignment like this is more complex for secondary students and again, a graphic organizer is helpful for students to draft their Pop Sonnets in the correct rhyme scheme to match Elizabethan English sonnet formula. Imagine what you might inspire if you assigned students to find a contemporary text and rewrite it into Shakespeare's Elizabethan English.

Excerpted from Chapter 4, "Poetry: Traditional, Visual, Makerspace."

SHAKESPEARE SONNET CLOSE READING & ANALYSIS VIDEO ASSIGNMENT

SONNET 29	PARAPHRASE IN YOUR OWN WORDS
When, in disgrace with fortune and men's eyes,	
I all alone beweep my outcast state,	
And trouble deaf heaven with my bootless cries,	
And look upon myself, and curse my fate,	
Wishing me like to one more rich in hope,	
Featur'd like him, like him with friends possess'd,	
Desiring this man's art and that man's scope,	
With what I most enjoy contented least;	
Yet in these thoughts myself almost despising,	
Haply I think on thee, and then my state,	
Like to the lark at break of day arising	
From sullen earth, sings hymns at heaven's gate;	**Word Bank**
For thy sweet love remember'd such wealth brings	**Beweep:** lament; to cry over
That then I scorn to change my state with kings.	**Scope:** outlook or view

Summary	Figurative Language Devices

Tone & Mood	Theme
Sonnet 29 shows the poet at his most insecure and troubled. He feels unlucky, shamed, and fiercely jealous of those around him.	

FIGURE 4.2 To help students read and make sense of Shakespeare's Sonnets, I provide this graphic organizer. Sometimes I fill in some information to help students draw connections or nudge them to notice something specific in the text.

Excerpted from Chapter 4, "Poetry: Traditional, Visual, Makerspace."

Listening and Spoken Poetry

With all the emphasis on reading and writing, we often forget that great stories and poems were meant to be heard as much as read. Listening to poetry read aloud helps readers and writers understand the complexity of compact words, bringing meaning to the forefront with rhythm, rhyme, pause, and emphasis. When we hear a poem, words come to life. **Table 4.1** highlights some of my favorite poems to listen to. (Please be sure to preview these before you share them to make sure they are appropriate for your students.)

Another good source for listening is the YouTube channel of Poetry Slam, Inc. (PSi). The PSi mission is to "promote the creation and performance of poetry that engages communities and provides a platform for voices to be heard beyond social, cultural, political, and economic barriers," leading to "a world where all persons have the ability to express themselves creatively through poetry using the power of voice" (n.d.).

RECITATION COMPETITION

Speaking and reciting poetry is helpful for students' understanding, and sometimes a competition is just the incentive students need to give it a try. Poetry Out Loud is a national program that promotes poetry through memorization and recitation. Students must memorize and present a poem of their choosing from the official Poetry Out Loud anthology, competing locally and, potentially, nationally with other high schoolers for cash awards. In partnership with the National Endowment for the Arts and The Poetry Foundation, Poetry Out Loud offers lesson plans, videos, recitation tips, and its poetry anthology online. In my district, the high school participates in Poetry Out Loud annually. Students prepare in class and then compete school-wide one afternoon in our media center. Some students have even gone on to compete at the state and national level. Holding a classroom or school-wide poetry reading showcases the spoken word as well as helps students understand the depth of each poem selected and presented for others.

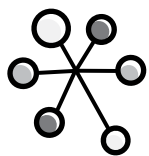Excerpted from Chapter 4, "Poetry: Traditional, Visual, Makerspace."

TABLE 4.1 **Poems for Listening**

Poem	Poet	Reading Link
"And Still I Rise"	Maya Angelou	youtu.be/JqOqo5oLSZo
"Blink Your Eyes"	Sekou Sundiata	youtu.be/RRonTMg3kbs
"I Am NOT Black, You Are NOT White"	Prince Ea	youtu.be/qoqD2K2RWkc
"To This Day"	Shane Koyczan	youtu.be/ltun92DfnPY
"21"	Patrick Roche	youtu.be/6LnMhy8kDiQ

Excerpted from Chapter 4, "Poetry: Traditional, Visual, Makerspace."
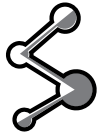
Imagine your students presenting their own spoken poetry or hosting a poetry slam for the school community. As Andrew Simmons explained, "Reading original poetry aloud in class can foster trust and empathy in the classroom community, while also emphasizing speaking and listening skills that are often neglected in high school literature classes" (2014). When students read poetry aloud, they gain a deeper understanding and are able to use tone, pause, and vocal variation to suggest meaning.

Give them opportunities to read their poetry aloud in the classroom or other settings. When I was a student, for example, my high school hosted monthly coffeehouse evenings. Our school cafeteria was transformed into a coffeehouse, and students would sign up to present, perform, and showcase their talents. There were bands playing, spoken word, song, and even stand-up comedy. With the lights dim and students gathered together after school hours, it showcased students' talents and passions as well as celebrated the arts. Allowing students the time to write their own poems for a poetry slam, school-wide event, or just for the classroom, can produce inspiring and moving outcomes.

Writing Poetry

Writing poetry builds on what students already know about language, words, and figures of speech. When writing poetry, students are developing their reading, writing, and thinking skills—all while playing with words, images, sounds, rhythm, and ideas. Poets present vivid pictures through sensory images, words that appeal to sight, hearing, touch, taste, and smell. Someone once told me that poems are like buildings, some are long and skinny, sometimes with only one word on a line. Others are wider with much longer lines. The choice is personal: Each writer has to decide how their poem should look and sound in order to convey their perspective and vision. Additionally, poets also think of the blank space and make decisions where to pause, stay silent, and leave something unsaid. Give your students the opportunity to try a variety of poetry formats and styles, such as:

✧ **BIOPOEMS** or **HISTOPOEMS** provide students with the opportunity to create a biographical or historical summary about a topic or person. Each line

Excerpted from Chapter 4, "Poetry: Traditional, Visual, Makerspace."
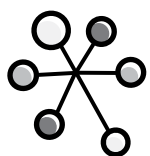
of a biopoem or histopoem has a prescribed focus, guiding students to summarize the information from a variety of perspectives. Biopoems and histopoems are great to use in social studies, science, and with literature.

✧ **BLACKOUT POEMS** are artistic creations that repurpose a text into a blend of words and images. Writers keep visible the words on a page to use and then black out or obscure the words that are not needed, sometimes with elaborate illustrations.

✧ **FOUND POEMS** are created by rearranging words from an existing text to create new meaning. Found poems are like word collages.

✧ **FREE VERSE** is a poem that does not follow any rhyme scheme, meter, rhythm, or specific form. There are no rules with free verse poems.

✧ **HAIKU** is traditional Japanese poetry that follows a specific format. These seventeen-syllable poems are often about nature and don't rhyme. Haiku's three lines follow a five-, seven-, and five-syllable pattern.

✧ **LIMERICKS** have strong rhythms and rhymed verses. These five-line poems are often funny or tell a joke. The Poetry Foundation identifies the rhyme scheme of limericks as "AABBA, in which the first, second and fifth line rhyme, while the third and fourth lines are shorter and share a different rhyme" (n.d.).

✧ **ODES** celebrate a person or thing and date back to antiquity. In Greek, *ode* means to sing.

✧ **SONNETS** come in many styles, but all typically have fourteen lines written in iambic pentameter. The rhyme scheme depends on the type of sonnet. For instance, Shakespearean sonnets have a rhyme scheme of ABAB CDCD EFEF GG across three quatrains (four lines in a group) and a couplet (two rhymed lines) at the end.

Artifacts and tangible items, such as photographs, objects, other poems or quotes, can inspire students when writing poetry. Students can model other poems, mimic examples, and write about their own observations, experiences, and memories. Writer Lillian Morrison pointed out, "Writing poetry can be a way of pinning down a dream; capturing a moment, a memory, a happening. It's a way of sorting out your thoughts and feelings" (as cited in

Excerpted from Chapter 4, "Poetry: Traditional, Visual, Makerspace."

Fitch & Swartz, 2008). When students have a tangible picture or artifact, they can examine their subject the way an artist studies a subject for a painting: closely and critically, capturing the essence of the subject.

Often during my class poetry unit, I lead a lesson in which students try out multiple poetry forms and suggested topics. The important thing is for students to express themselves. I give students a series of topics to write from. Completing these poetry starters and seed ideas as a series of quick writing exercises generates a lot of ideas consecutively so that students have five or six quick starts for poems. The object of the lesson is not to create the perfect poem but just to capture some thoughts in writing. I don't expect students to finish a whole piece in the short time of doing the quick writes, but I hope they will produce a piece with potential that they might want to develop later in a writing workshop. **Figure 4.3** showcases many of these quick write prompts.

Say It, but Don't Really Say It Poem	Eve Merriam's poem "New Love" expresses love without ever using the word. How then do we know that she is talking about love? Have your students write a love poem (or a poem about anything) without including the word it's about.
Write Based on Another Poem	Have students write based on a mentor poem, responding to the author and images in the poem. For example, students could argue with the poem, or write about the memories or thoughts the poem evokes. Students could talk back to the poet by writing a letter sharing their story, experience, or argument.
"Tell All the Truth but Tell It Slant"	Emily Dickinson wrote, "tell all the truth but tell it slant." Students can write true statements about themselves and then "slant," or stretch, one truth. This is a spin off the icebreaker activity Two Truths and a Lie in which people write down two true statements about themselves and one lie; others in the group then have to identify the truths and the lie.
Hopes and Dreams Poem	In Mary Oliver's poem "The Summer Day," she wrote, "Tell me, what is it you plan to do with your one wild and precious life?" After reading this poem with students, use the last line as a challenge for your students to write down their life ambitions and dreams.
Shakespeare for 2019	Like the reverse of Pop Sonnets, this activity is about translating Elizabethan sonnets into contemporary poems. How would Shakespeare express his ideas if he were living in this day and time?

FIGURE 4.3
Quick write poetry activities help students develop possible poems and seed ideas.

Excerpted from Chapter 4, "Poetry: Traditional, Visual, Makerspace."
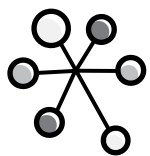
These are only a handful of poetry quick writes that you can do with your students to produce seed ideas for poems. If we are going to develop the writing and critical thinking skills of our students, teachers "need to use a variety of strategies to plan, revise and strengthen their writing as they work independently and collaboratively with adults and peers to produce texts," in this case, poetry (New York State Next Generation Learning Standards, 2017).

Once students have a collection of poetry they can share their portfolio with others in creative ways. The idea is that the poems are not just written for the teacher but for a wider audience, an authentic audience. Students can use digital platforms to reach a global audience, such as through a blog, or can share poetry recordings in a closed space such as Flipgrid, or they can read their work at live events held in the school and community. Other possibilities include creating videos or narrated slideshows with iMovie, podcasts, dioramas, museum displays, or ebooks. Students could even pursue publishing their poems with online publications like *Teen Ink*, *Teachers & Writers Magazine*, and *Merlyn's Pen*.

Excerpted from Chapter 4, "Poetry: Traditional, Visual, Makerspace."

New Realms for Writing: Inspire Student Expression with Digital Age Formats
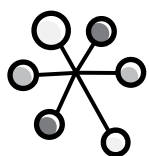
Filmmaking and Screenwriting

In the age of the Common Core State Standards, teachers are asking students to "mine the text for details, ideas, and deeper meanings" (Fisher & Frey, 2014). Just as print text is layered with words, images, inferences, and evidence, so is film. If students are to develop deep understanding of texts, teachers need to model close reading skills to film too. In my media literacy course for seventh and eighth graders, we focus on visual literacy and watch many films together, reading and viewing them closely like any written text. Along with studying these models, writing and creating films is a big part of student work.

When watching a film, students should view for content analysis and understanding, but also to understand the filmmaker's point of view and purpose. In class, we discuss and examine the types of shots, match-on-match transitions, diegetic sound (any sound that originates in the film), and nondiegetic sound (sound that doesn't originate in the film but is added during the editing process, such as sound effects, narration, or musical score). We look at the use of music, color, and homages to other films and directors. Students learn about film tropes and characterization. The Jacob Burns Film Center (JBFC) provides a Visual Glossary on its website with terminology relating to film and media, offering not only definitions but also film clips to illustrate the concepts. By learning these terms, applying them to the creation process, and naming the movies that they are making, students not only build disciplinary vocabulary but also their sense of possibility expands. When analyzing film or creating a media text, we want students to understand that a filmmaker makes deliberate choices to convey a message or emotion the way an author selects specific words to convey meaning. This element relates to craft and structure as identified in the Common Core State Standards.

Excerpted from Chapter 6, "Real-World Writing: Writing Skills to Succeed Beyond School."

Crafting Fiction Films

The students' culminating project is to write a script and produce a film for a larger audience. As fans of *Stranger Things*, one class and I focused on suspense and the elements of suspense. First, we deconstructed the work of master suspense filmmakers, such as Alfred Hitchcock, and then students wrote the script for their suspense story, storyboarding the types of shots necessary to convey the plot, conflict, and characterization. Lastly, students went into movie-making mode.

Creating is a digital age skill, and the creation process is just as important as the final product. When students are creating film projects and writing their own scripts, designing the set, and making choices about lighting, sound, and editing, they are demonstrating critical analysis, creative collaboration, and multimedia communication. For ideas of projects that use these skills beyond full-scale movies, see the sidebar "Visual Writing Projects."

Writing a script for a film has its own specific format and requirements. Like writing any good story, when creating a movie, students need a beginning, middle, and end. Most importantly the story needs conflict to drive it. Students have to create authentic characters that viewers empathize with. It all begins with one thought, a seed, a spark, an overheard conversation, and an idea is born. Yet a writer or filmmaker cultivates the idea, outlines, drafts, and sketches the paths where the idea is to expand to reveal a story. Students need to outline and sketch their ideas like real writers and artists. Storyboards are great scaffolding tools to help students put their ideas down on paper and unravel the threads of ideas that encompass their story.

When students get stuck writing and creating, we look at how other films address similar ideas. When my students were trying to convey a sense of time in their movie, we looked at how Disney Pixar's *Up* (2009) uses time-lapse to show the passage of time: Every morning Carl's wife Ellie straightens his tie before work. To depict their long life together, the shot zooms in on one tie, then fast forwards through a sequence of many ties to suggest years passing, until the camera pans out and Carl and Ellie are elderly. (Scan the Time-lapse Example QR code, and fast forward to the 2:17 mark to watch this scene.) Watching this clip together helped my students think about how they might show time in a film.

Time-lapse Example

Excerpted from Chapter 6, "Real-World Writing: Writing Skills to Succeed Beyond School."
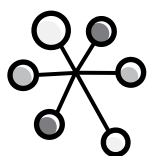
VISUAL WRITING PROJECTS

Here are more filming options you can do with your students in one or two class periods to building their visual literary and writing skills:

○ **BOOK TRAILERS:** I often have students make a book trailer for their favorite book. Any good preview needs a balance of words and images to invite others to read the book.

○ **CHARACTER MUSIC VIDEOS:** When my students read Agatha Christie's *And Then There Were None*, they work in small groups to select a character from the text, choose a theme song for that character, and create a music video to convey his or her characterization. If your students are musically inclined, you might even assign students to create their own song that represents the character. This blends creative writing and filmmaking.

○ **ART COMES TO LIFE:** Inspired by a wordless picture book, students use an image from Chris Van Allsburg's *The Mysteries of Harris Burdick* as a catalyst to create a video that expands on the mystery of the picture presented in the book. Students can choose between making a silent film or one with dialogue.

○ **FILMS GENRE PROJECT:** I often give my students choices with the projects they create in my classroom. When students are studying Shakespeare, I give them the option to present a scene as a silent film, rap, or musical. You can have students reenact a scene using any film genre.

○ **TED TALKS:** We all watch them. Have your students create a short TED talk about their own passion and interests. Sir Ken Robinson's "Do Schools Kill Creativity?" (2006) offers a catalyst for students to craft their own TED talk on how to make their school a better place.

○ **PREZI SCREENCASTS:** Students create a presentation using Prezi or Microsoft PowerPoint and then screencast themselves giving the presentation.

These informational texts could be used to teach, inform, or narrate content.

○ **LEGO MOVIES:** My son is obsessed with Legos, which inspired me to ask him to help me create a Lego version of a few scenes from *A Midsummer Night's Dream*. We took still pictures of various Lego scenes and screencast the images and text together. Your students could do the same with any poem, book, or play. (See Chapter 5 for more about how much fun Legos can be as a teaching tool to spark creativity.)

○ **COMMON CRAFT VIDEOS:** I love the ideas and images presented in many the Common Craft videos. Technically, these are screencasts of illustrated presentations. You can have your students create Common Craft–style videos on their own or using the Common Craft Cut Outs. You can sign up for a free pack of twenty-five Cut Outs online or pay a fee to access the complete library available on Common Craft.

○ **INTERACTIVE ADVENTURE VIDEO:** YouTube has a feature that allows you to link videos within videos. In the past, my students created a series of videos that analyzed critical theories of gender, race, and class in Disney animation. We linked all the videos together, allowing viewers to choose customized paths for learning or investigation. The same could be done with story flow if students write a branching story with multiple paths to different endings, similar to the *Choose Your Own Adventure* series of novels.

○ **STOP MOTION ANIMATION:** As detailed in Chapter 5, there are so many possibilities for students to create a stop motion animation to explain a concept, continue a story, and more.

Excerpted from Chapter 6, "Real-World Writing: Writing Skills to Succeed Beyond School."

For more sources of inspiration, try the *Anatomy of a Scene* video series from *The New York Times*. Found on the newspaper's website, the series presents analysis of current movies by having a film's director or producer talk through a scene and the decisions behind it. These short clips showcase types of shots, locations, special effects, and lighting and sound choices. The *Anatomy of a Scene* videos are helpful models and teaching tools for students to craft their own films and borrow film techniques from filmmakers today. Using movies as a teaching tool helps students grasp various concepts and ideas. Think about how you can use movie clips to help teach point of view, structure, and more.
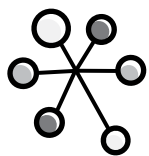
Documentary Films

Researching to build knowledge is also a core skill, and creating documentary films is a creative way to give students practice. Writing different text types and for different purposes is a requirement for students to be college and career ready. When I came across the Op-Docs, short documentary videos on *The New York Times* website, I knew I had stumbled on a teaching tool gem. As its website states, Op-Docs are "documentaries, most under 15 minutes, that touch on issues like race and gender identity; technology and society; civil rights; criminal justice; ethics; and artistic and scientific exploration" (2018). These short films showcase aspects of life that are hidden or unspoken. For instance, *San Quentin's Giants* is an intriguing documentary about the San Quentin prison baseball team that showcases how baseball is a vehicle for reform, reflection, and purpose for the players. Whereas San Quentin uses storytelling and interviews, the Op-Doc *A Conversation About Race* features individuals talking about race and racism. This documentary can be used as a catalyst for classroom discussion or a project: What would this same conversation look and sound like in school from the students' perspectives?

San Quentin's Giants

After watching a number of these Op-Docs with my students and discussing the research and filming elements involved, I ask students to research and investigate the issues that are worth shedding light on. Some students addressed bullying, whereas another group researched video game playing and addiction

Excerpted from Chapter 6, "Real-World Writing: Writing Skills to Succeed Beyond School."

among young people. In completing this documentary project, students had to gather relevant data from multiple sources, assess the credibility and accuracy of each source as with any research project, and integrate the information in documentary film writing. This led to conversations about bias and author's purpose. We addressed the danger of a single story, the importance of presenting multiple voices throughout the documentary, and the need to look at the different arguments surrounding their topic. After the research was conducted, students had to decide how they wanted to string together the facts. We looked at the differences between TED Talks, which are straightforward lectures, and Op-Docs, which blend a bit of narrative with information and argument writing through visual storytelling. On paper and in writing, students can use documentary filmmaking to make insightful arguments, illuminate different perspectives, and analyze a subject. When we add a visual emphasis with filmmaking, the writing and arguments are elevated. Students' attention to detail is expanded and literacy concepts developed.

Video and Filmmaking Tools

The two tools that my students and I use most often for creating videos are iMovie and WeVideo. Free for MacOS and iOS devices, iMovie enables students to use iPads to record and edit video. Available in free and paid subscriptions, WeVideo also has some really cool multimedia editing tools, green screens, and templates that teachers and students can use to create film and video projects. For example, an actor can shrink themselves for a special effect. If you're filming in school and need a specific background, use one of the templates or consult the lesson plans available in the Resource Hub on the WeVideo website. If you are a Google school, WeVideo synchronizes with Chrome. Green Screen by Do Ink is another video-making tool that is popular in elementary schools. Available for iOS devices for a fee, Green Screen enables you to create videos and choose a background to composite in behind the scene.

Excerpted from Chapter 6, "Real-World Writing: Writing Skills to Succeed Beyond School."

LEARNING TRANSPORTED

Augmented, Virtual and Mixed Reality for All Classrooms

JAIME DONALLY

The following excerpt is from this book.
Check out the complete book at iste.org/TransportLearning

6 Open Collaboration and Exploration

Although some immersive technology tools are specific to a content area or objective, the resources in this book are adaptable to most classroom lessons. The activities in this chapter provide a general overview of some of the immersive tools and ideas for adapting them to student needs. The purpose of these activities is to gain a deeper insight into the tools and spark creative ways they can be used to engage our students.

Scavenger Hunts

There are many ways to use location-based messaging in education. The most commonly used way is a scavenger hunt. In a scavenger hunt, students search for items in a list—these can be objects or landmarks—and try to be the first to cross all of them off their list. There are many ways to tie scavenger hunt activities to learning and curricular goals. For example, hunts can tie in with a book the class is reading, a time period they are studying, or contain objects with certain scientific properties. With students who are beginning at a new school, scavenger hunts may be beneficial to cover various areas in the school and include rules and expectations. The tools described in this section can be used for scavenger hunts or other location-based activities.

WallaMe

The WallaMe app is a fairly new tool that uses augmented reality and location-based messaging. The app offers teachers a unique way to create a scavenger hunt by designing AR messages and leaving them in specific places for students to "discover." The messages can include typed text, drawings, stickers, and pictures. The

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student downloads the WallaMe mobile app on iOS or Google Play and searches for walls to view. When a student is in close enough proximity, the walls will be available to find and view (Figure 6.1). When the wall is found, the student can view the message and take a picture of the wall that is saved to their camera roll. Your wall can be private for a single individual, shared with a specific group of students, or open to the public to find and view.

Using the WallaMe app in the classroom is not limited to scavenger hunts. The teacher can leave notes, tips, activities, or other information floating around that students can capture every day. The students can create walls as a response exit ticket, or provide support for classmates on solving a problem. The WallaMe app can be a tool that parents use when visiting the classroom for Meet the Parents Day. Using the app to identify directions such as north, east, south, and west or solving math problems using nearby resources are ways the app can get students actively engaged and learning. The exciting element of discovering information makes the WallaMe app adaptable to any subject or grade level.

Figure 6.1

WallaMe app detecting a wall message.

The WallaMe app isn't intended for educational use only, so the rating is listed at ages 12 and up. The goal is to see these companies leading the way to create engaging activities that educators can adapt for the classroom.

Metaverse

The Metaverse app allows the educator to create multiple activities that include augmented and virtual reality. The students can engage in lessons that have a leader board to facilitate competition and challenge the students to work harder. The app uses GPS to provide activities to individuals who are in the correct location.
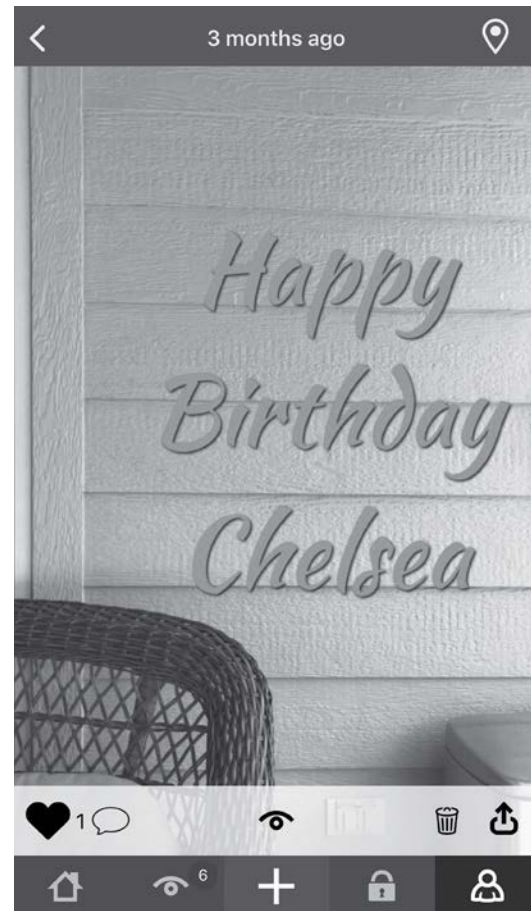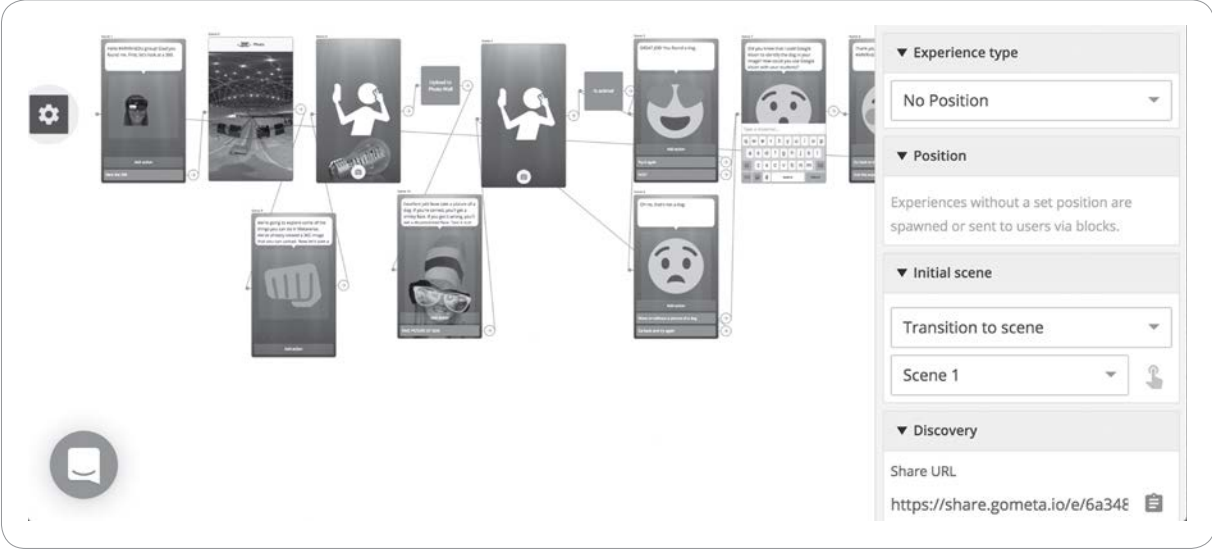
61

Figure 6.2
Metaverse Storyboard

The Metaverse app provides a storyboard, scenes, and blocks for educators to use to create experiences for their classroom (Figure 6.2). The website consists of several support videos to create content and provide a meaningful lessons for the students. The experience is shared by location, search, or shared by the educator with a permalink. The Metaverse app can be a basic lesson or made quite complex depending on the teacher's skills and needs for the lesson.

Some ways teachers can adapt Metaverse into their lessons are by:

- providing a personalized 360° virtual tour comporised of images and video;
- having students capture specific items in the scavenger hunt; or
- including assessment questions within the scavenger hunt.

The Metaverse app is a new concept for educators as it provides a way to create your own immersive technology experiences beyond the basics, but it has a significant learning curve when you first begin. As the application develops into an easier platform to create AR and VR experiences, I believe more of our classrooms will use it as an alternative to what is currently available in immersive technology apps.

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Waypoint EDU App

The Waypoint EDU app has created an educational scavenger hunt using augmented reality. Educators can easily add questions that address lesson objectives, set the specific locations where the questions are hidden, and then have students hunt for questions following the map. The hunt is easily shared with students by airdrop, email, messages, or by sending the link in another platform.

The benefit of the Waypoint EDU app is getting students get up and roam around the established boundaries set by the instructor to search for each question. The excitement of the hunt drives them to search for questions, solve them, and add coins to their treasure for solving the problem. While the Waypoint EDU app requires newer iOS devices, the expansion to Android devices is coming. In addition, features such as uploading your own 3D objects will be part of the future updates.

Other Apps for Scavenger Hunts

Other educational apps that are beginning to use augmented and virtual reality with scavenger hunts are GeoGuessr, Gamar, and QuestUpon. These apps provide opportunities to engage in scavenger hunts while bringing in educational content. The apps are currently limited in content and availability to specific locations, however, the interest in augmented and virtual reality games is growing.

> **GeoGuessr** uses 360° images from Google Streetview to explore an area. The object of the game is to identify your location with more precision than your opponents. The app categorizes a general location and the game sends the participant to multiple locations in that category. The game can be played on mobile devices and in a browser.
>
> The **Gamar** app is mainly used for museums and universities. The benefit of this augmented reality scavenger hunt tool is the option to create your own experience. Although you can't share your custom hunts publicly without a paid subscription, students can engage in the hunt on the device it was created on.
>
> The **QuestUpon** app has a great concept with interactive augmented reality games. The various quests take place in different parts of the world, so when the quest gets to a specific section, the user must be located in the correct spot to move on. As we see more scavenger hunt apps created, we will find that the exact location should not be required to engage in all the experiences.

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Breakout EDU

Breakout EDU has become a popular game in education. It is driven by creativity, teamwork, and problem solving. The game provides a fun learning experience as it challenges students to compete in solving puzzles to win. The game centers around a series of questions. Each solved question results in unlocking the next part of the activity. As students work in groups, they compete against other groups to open all the locks first. The questions can be designed to challenge the students in all content areas and often the games include physical locks.

Although the physical locks are a fun way to see each question answered correctly, an alternative method to participate in Breakout EDU is in digital format—and with immersive technology, this becomes even more engaging for the participants. In fact, Breakout EDU can be an effective, hands-on way to introduce these tools. In this variation, players rotate through different stations, with each station consisting of questions to be solved. The questions are intended for a professional development training on augmented and virtual reality apps. The lesson uses devices instead of physical locks and the devices are set with unlock codes to open up the next experience. When you find the solution to each challenge, the answer to the solution is the unlock code on the next device.

The unlock codes are single digit letters in this activity, however, the codes can be modified to fit multiple letters, numbers, or codes to solve the previous question. If the solution to the activity is the letter C, then "C" is the unlock code for the next

Figure 6.3
Breakout EDU Techno Style game (tiny.cc/breakoutiste)

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device. If the team is unable to get the correct answer, they must go back and evaluate the question again. If the answer is correct, the code will unlock the next device and present the new challenge to solve. Each of the challenges features an AR or VR app for the classroom. Located at each station is a piece of paper describing the challenge and the tool. As groups visit each station, they have a sheet of paper to write down their solutions for a final activity. Here is an example of the challenges at each station.

In the first station, educators use the Google Translate app to translate text from Russian to English. The words in Russian are translated to say, "Two Letters After T." The educators will open the app, select the correct languages, and select the camera to view the words, which automatically translate into English. Only by using the augmented reality feature in the app can the educators know that the answer is the letter V. The unlock code on the device at the next station is "V," which the group will write on the solution sheet.

The next station features the RoundMe app, where you can view 360° images. Following the instructions, the educator will type in the search bar: "VIEW FROM THE TOP" and select the first 360° image available. The educator needs to identify where they are located (Eiffel Tower) in the 360° experience and write down the first letter of the location on the solution sheet. The educator will learn how to use the RoundMe app and use the unlock code "E" at the next station.

The third station uses the Quiver Vision app to show how a coloring page can come alive in augmented reality. The image shows an animal cell that, when viewed in the app, displays in AR the name of each of the parts. One of the parts is colored red and the educators will determine the last letter of its name. The last letter of the name is "I," which is the unlock code on the device in the next station.

The fourth station uses the CoSpaces app where the educator can type in the link and immediately get pulled into a 360° experience. The challenge is to identify the first letter of the color of the shirt warn by the man sitting down. The correct answer is white, which makes the unlock code "W" on the device at the next station.

The last station uses augmented reality to create a circuit board. The educators must identify the first letter of a critical piece on the board to solve the answer. The correct answer is the switch, making "S" the unlock code at the first station. The last station will rotate to the first station at the beginning.
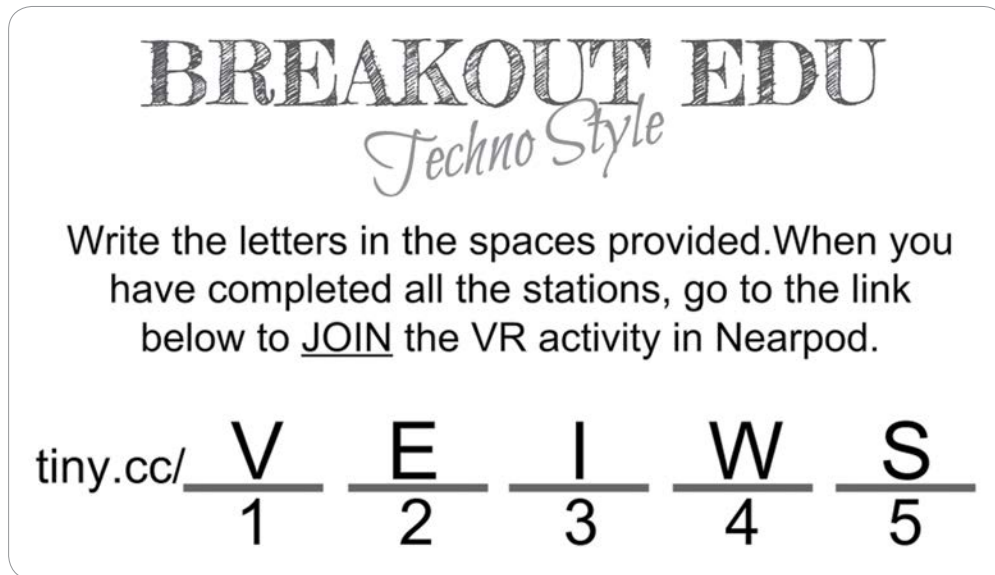
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Figure 6.4

Breakout EDU Answer Sheet

When running this activity, I have the educators start at any station and rotate the groups every five minutes. The answer sheet (shown in Figure 6.4) has all the unlock answers from the stations, which reveal the link to the final Nearpod activity. By creating a shortened link in tiny.cc, the game can be adjusted when changes are made. Creating a Breakout EDU game can be simple or extensive depending on how complictated or customized you want to make the challenges. Many challenges can be found at the breakoutedu.com website and can be filtered by grade and subject level.

Exploratory Play with Cubes and Blocks

Using the simple concept of playing with blocks, developers have come up with a way to incorporate play with immersive technology. Using cubes that have six faces, each of the faces features a trigger image to scan for augmented reality. In many cases, combining cubes together to create a new trigger image brings the most interaction and engagement. Each of the cube resources function differently to provide multiple learning activities at various grade levels.

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Some of the cube activities involve building with blocks, similar to Minecraft. The apps use a trigger image to identify where to layer the blocks using the device camera. Building with 3D blocks in our world is much more realistic than in a virtual world. The following apps include interactive learning experiences that feature construction and provide multiple learning opportunities for students.

EON Experience

Although the EON Creator app has many augmented and virtual reality lessons, the free EON Experience app includes an activity to build with blocks using the EON trigger image. Students can scan the EON trigger image and keep it in the camera view in the app while they build on a block similar to Minecraft. The opportunities to explain gravity, reactions, environments, or many other topics are endless when giving your students the chance to show their knowledge the same way they prefer to play.

The best part of the experience is that the app remembers what was created so the structures can continue to grow and develop throughout time. Other than a traditional video game, it's rare to find an activity that remembers what was already built and this is especially true within augmented reality. EON Experience is currently building multiplayer options to allow multiple students to build in the same space at the same time using augmented reality.

World Builder enables our students to become architects to create unlimited structures using blocks. The benefit of the app is the ease of use as it identifies the EON trigger image and immediately provides the building blocks to design a structure. Using World Builder in the EON Experience, students can design structures using various architectural styles that match available materials, fashions, beliefs, technology, weather conditions, and regional characteristics. The building projects can demonstrate knowledge of cultures and history. Providing a platform for students to build using augmented reality allows students to show knowledge in a non-traditional format and demonstrate a much deeper understanding.

Try It! Build Something in EON

To begin using World Builder, download the EON Experience app from iOS at tiny.cc/eoncreatorapple or Google Play at tiny.cc/eoncreatorandroid and open the World Builder activity under Edutainment. You will need the EON trigger image found in the EON lesson plans in the previous chapter or on the EON Reality website at eonreality.com/eevr. While looking at the trigger image through the camera in the app, the options to build a structure appear around the corners of the screen.

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Select the material for the structure by touching the spinning cube and then place the plus sign in the middle at the location where you want to add the cube. Select the large button with the hand to place the cube in that spot.

ArCraft

Building games are popular with students mainly because they offer creativity. The blocks are versatile enough to make just about anything, and students seem to enjoy the challenge of undertaking the most difficult builds. ArCraft takes the concept of building within a 360° environment and places the building on top of your own trigger image using augmented reality.

When starting ArCraft, the app will show the options to play or load a game. When selecting load, the game will load any previous builds made in the app. Again, this preservation of previous work is another great and rare feature. If play is selected in the app, a new build will begin. The first requirement to start a new build or load a previous build is selecting an appropriate trigger image. A quick reminder, trigger images are best when they feature high contrasting colors and are scanned in good lighting. When the proper trigger image is selected, the building can begin. The trigger image can be different each time you come back to the app to build.

Similar to Minecraft, the blocks vary as they have different purposes. However, the ArCraft app uses different blocks to create a theme for your build rather than to distinguish functionality. The blocks are found in the chest, called the "sandbox" and resemble grass, dirt, brick, wood, water, and more. These blocks can build structures, animals, plants, and just about anything else. Showing knowledge through 3D objects makes the learning more fun, relevant to student interest, and is flexible with any content or grade level. An elementary student can build a structure that measures a specific width and height, while a secondary student may design a functioning house that conforms to a specific surface area.

AR Circuits

The AR Circuits app brings together fun and learning by exploring the basic concepts of circuits and electricity. No electronics kit in your classroom? No problem. The AR Circuits app brings the experience through your mobile screen using augmented reality. The app has a small cost to download in both the Google Play and App Store but is well worth the price. The printable trigger image cards have symbols to represent components. Each card serves a different purpose to make working electric components. When viewing the trigger image cards within the AR Circuits app, the cards turn into realistic simulated components.

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As the cards are rearranged, the activity builds knowledge about various components including the wire, battery, switch, bulbs, resistor, and conductor (Figure 6.5). The various parts can be placed together to turn on a bulb using the right components. The user can dim the bulb by adjusting the resistance and the battery voltage.
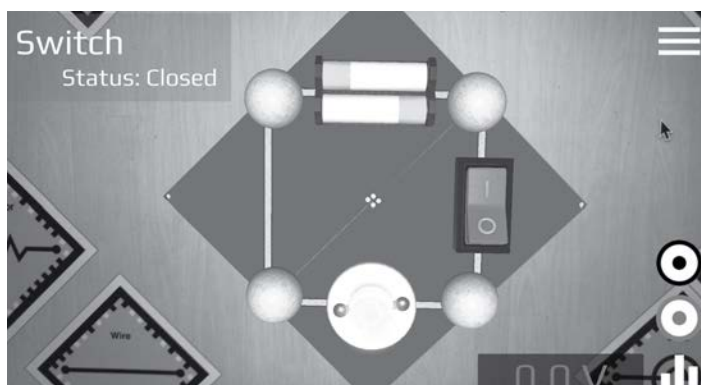
Figure 6.5
AR Circuits App

In addition to exploring the cards, the exploratory play within the app builds knowledge about each of the components. When a required component is missing, it's clear that the bulb is not receiving electricity. The activities allow the user to receive immediate feedback by testing out the various combinations of components and seeing the results. The combinations are seen through the mobile device in augmented reality and either present no light, a dim light, or a fully lit light.

One of the main reasons AR Circuits is so fun is because it requires problem solving. The mystery of finding out how to turn on the light is just the beginning. Determining how many lights a battery can power or what happens when adding resistance were some of the explorations I went on when first playing with the app. Having no background with circuits, I jumped at the opportunity to learn in a safe environment without feeling foolish if I didn't know the answer or chose incorrect combinations. In addition, I didn't have to buy a kit or find the tools to create light. The AR Circuits app provides the learning without the worry of the dangers such as broken bulbs and burns.

The flexibility to explore the app on paper was helpful but printing out the trigger image cards may not always be an option. The virtual cards are a convenient way to explore the app with all the components available. The cards easily align against one another without overlapping. I found it difficult to line up the paper cards as they can easily slide on top of each other.

One of the ways to align the trigger image cards more easily is by printing out the cards on a net that folds up to cubes similar to the 4D Elements. The cubes make it easy to align the components without the pieces of paper sliding on top of one

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another. The option to print out cards with or without the names of the components is available as well as printing out the cards on a cube. The app also provides a virtual voltmeter to determine the electric potential. When two components are connected, the voltmeter can determine the voltage by selecting the junction where they meet.

MERGE Cube

The MERGE Cube is an appealing choice for educators, who are snatching up the reasonably-priced accessories to use in the classroom, and for good reason. What's not to like about a hologram you can hold in your hand? These six-sided, lightweight cubes are covered on each side with glyphs that transform into lifelike AR and VR images when viewed through a device or headset. Retailing at $14.99 or less at the time of this printing, the cubes are a great, hands-on way to get started with immersive technology.

While augmented reality features in a cube have been around for a few years, MERGE takes a different approach as a distributor of apps and games developed by others. The apps are shared by the MERGE company, but the developers create the apps for the cube and individual purchases are made based on the developer's price. Many of the MERGE Cube apps are free to download and test out.

Figure 6.6
MERGE Cube Galactic Explorer

The apps use both augmented and virtual reality for activities using the cube. MERGE also sells a headset with the camera exposed that works perfectly with the software and provides the full experience. Both the viewer and the cube are made of a foam material, making it easy to clean and safe to use without worry of breaking. The viewer adds an additional layer of protection to the device while holding the cube in your hand.

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Here are a few apps to try out with the MERGE Cube.

The Th!ngs app is the best MERGE Cube app to begin exploring the features of the cube. The app provides an assortment of experiences—from holding a fire in your hand to flying through the universe in a space ship. Using both augmented and virtual reality, the cube brings hours of entertainment to a wide range of ages and interests. The Th!ngs app is a great way to get a sample of the MERGE Cube's capabilities.

One of the apps that I found to be interesting for education is the building app **Dig!** Similar to Minecraft but building on or into the cube instead of in a device screen, the app allows the user to customize the cube by adding blocks. Some of the resources include stone, sand, grass, brick, and lava. The difference between the Dig It app and others is the ability to see the cube in augmented reality with little interruption. The cube has great contrasting color to give a seamless adventure. The toolbox gives the user a chance to select a variety of resources while the build mode allows the you to add or take away blocks. The world setting opens the door to saved world or worlds that other builders have created and that are available to download. Beginning with another world can get the user more familiar with the tools and options in the app before starting their own build.

Another educational MERGE Cube app is **Galactic Explorer**, where students can explore our solar system in the palms of their hands. The app has a small cost to download in both the Google Play and App Store. While viewing the planets in orbit around the sun, users can select each planet to see a list of interesting facts about it. Viewing the planets from every angle may be exactly what a student will need to gain understanding about the solar system.

A storytelling app called **57° North** by Mighty Coconut provides the students a chance to explore a story with multiple variations as you "choose your path." As the story comes alive inside of the cube, the plot will pause and offer options to progress through the story. The students can choose their preferences by rotating the cube in the direction of their choice. The Mighty Coconut company has combined storytelling and AR in this delightful app, which is available for a small cost.

The **Dino Digger** app takes the experience of augmented reality in the cube and adds interaction. The students will become paleontologists and dig for fossils using various tools. As the bones are discovered, the student can add them to the museum to admire and learn about the dinosaur, all from inside the cube.

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The purposeful activities that combine AR, interaction, and learning are well executed in this app.

Want to test the experience of using a MERGE Cube to see how it might work with your classroom? You can download and construct a paper version that will work with your mobile device. Instructions are available here: tinyurl.com/y9r29jto.

Virtual Field Trips

Virtual field trips are one of the prime categories driving the popularity of virtual reality in the classroom. These types of field trips go beyond a digital experience to a virtual reality experience by giving a 360° view. The field trips give our students access to lead their own tour as they direct which location to explore. Students can spend the amount of time they need to discover new areas, artifacts, cultures, and more.

Student standards continue to emphasize global citizenship. As our students are required to have more connections around the world, we often look for these connections through video chats. A live video chat is one option to build global connections, but we must begin with building global knowledge to avoid offensive comments or propagating inaccurate facts. Preparing for international collaboration should include providing background for your students on the geography and culture of the students they will be interacting with. A virtual field trip can provide perspective, cultural sensitivity, and relatable conversations.

Allowing our students to explore anywhere in the world has many advantages. We are able to use virtual field trips to bring our students to impossible places such as a different time era, inside the cell of a living creature, or into an active volcano. These adventures can add depth to our lesson plans and replace or enhance pictures inside of a textbook. As students have more engagement with virtual field trips in their learning, there is a greater opportunity to deepen meaning, relevance, and retention.

Google Earth

Google Earth has been around for some time. What began as a website became an app and most recently added the benefits of 3D and 360° views. Exploring the world through satellite imagery is fascinating to reveal remote destinations and capture moments in history. To use Google Earth, use the Chrome browser and open earth.google.com or download the app in the Google Play or App Store. If you have an HTC Vive or an Oculus Rift, you have access to Google Earth VR. I anticipate the

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VR features will spread to other platforms in the future as more browsers adopt virtual reality.

VOYAGER   The most recent release of Google Earth has the Voyager feature. These interactive stories bring current and past events to life as they share 3D views, videos, and information cards. One of the highlights of Voyager is the hurricane Harvey experience that gives a full picture of the devastation that hit the southern portions of Texas with massive flooding in 2017. Describing the facts of the hurricane, Google Earth walks the viewer through numerous locations that had significant damage.

The students in Tracy Mercier's classroom at CREC International Magnet School of Connecticut enjoyed using immersive technology to learn. The kindergarteners explained they love to travel to different places through Google Maps. The students were able to visit a recycling center and were absolutely amazed with the experience. "The fifth-grade group were able to relive the revolutionary war and were able to travel back to colonial America to see where general Washington stayed during the war." (Mercier, 2017).

Through Voyager, the students can become explorers with Lewis and Clark, Marco Polo, and Eric the Red. Students can follow the journeys of Charles Dickens and Ernest Hemingway. In addition to these historical explorations, the locations you can visit are almost endless, offering travel to national parks, global beaches, stadiums, craters, and much more.

FEEL LUCKY?   Another feature included in Google Earth is the "I'm Feeling Lucky" tab. What an exhilarating experience to jump to an unknown location in the world that takes your breath away. Google selects a surprise location and shares new facts through a visual journey to that location. Imagine the places your students can explore every day while building global knowledge.

USA Today VR Stories

The USA Today VR Stories app has developed a powerful way to communicate using virtual reality. Bringing together relevant news stories and expanding them into a virtual, 360° setting is a brilliant to share experiences along with information. Students can engage in the latest news while being brought to those locations. The virtual reality experience is found in the USA Today app in the Google Play or App Store. The 360° stories can be found on the USA Today YouTube channel. One

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of the benefits of this resource is the access to the content on mobile devices and computers as an alternative to the app.

Storytelling in virtual reality is essentially what we are experiencing in VR Stories. One of the stories I watched was called the "Extraordinary Gator Feeding Frenzy in 360°." If you need an activity for a lesson on carnivores, you will want to check this story out. The story shows how Jim Darlington, the curator of reptiles at Saint Augustine Alligator Farm Zoological Park in Florida, finds his place among hungry alligators. The footage of the feeding frenzy is incredible.

Taking a step back into Medieval times, VR Stories does a great job of describing the sport of jousting. You'll learn all the strategies involved with the sport and how each move can potentially create a dangerous situation, including the point of contact in the competition, which can be intense. The actors describing life in simpler times is engaging and informative.

Another historical story that can offer an immersive experience is the reenactment of Pearl Harbor. Climbing inside of the virtual submarine was uncomfortable and I immediately felt claustrophobic. These historical stories bring our students into the events, where they are more likely to be engaged than just by hearing or reading about them.

Discovery VR

A similar resource to VR Stories is the Discovery VR app. This app brings many of the Discovery television shows into a 360° experience. Some of the most fascinating videos include the Discovery VR Atlas, where you'll be immersed into cultures and experiences around the world. The DNews Labs explore practical uses of science as it's found in the world around us. The science and technology resources are integrated throughout the app. Be advised, however, there are many 360° videos that are unrelated to education, so you'll want to explore the site before unleashing students on it.

RoundMe

The RoundMe site offers a variety of ways to explore 360° experiences. The original team was determined to use 360° photography for real estate and had a difficult time finding a place to upload these images. The site offers a way to explore beautiful immersive experiences. Although the views are breathtaking, the additional content with the locations make this resource a fantastic and easy way to use virtual reality with your students.

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There are several ways to explore experiences inside of RoundMe. A simple way to get familiar with the website is through the Explore tab, which gives you the top picks from the editors, new uploads, and the collections. The collections tab brings an assortment of common themed 360° images together in a virtual reality scene. The recent and top picks tab is constantly changing to feature new uploads and the search bar allows students to match places with their interests.

In addition, the option to search for 360° images and collections can be found in the world map view. The map view is easy to navigate as you click and drag on the page to find a specific location of images. Viewing the images through the map gives perspective on the geographical features in various regions. Students can explore regions and gather connections or identify specific architectural features prior to engaging in a new lesson.

Learning Transported Challenge

Using exploratory cubes, show how you've transformed your classroom with play.

Customize your own scavenger hunt or breakout activity for your students. Share your resources for others to adapt for their classroom.

Explore how you might use a virtual field trip or one of the Google Earth tools in a content area lesson. Share your ideas with the #ARVRinEdu community and get input.

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MOBILE LEARNING MINDSET

THE TEACHER'S GUIDE TO IMPLEMENTATION

CARL HOOKER

The following excerpt is from this book.
Check out the complete book at iste.org/MobileLearningTeachers

SMALL CHANGES AND THE SAMR MODEL

When I first started my current role, I felt as if there were a thousand different things that I needed to do. Besides sorting out all the technology that we had purchased, I also wanted to figure out what subscriptions were being used, what training we were offering, and what the needs of the teachers were. I tried to tackle all of these issues at once and quickly became overwhelmed.

Introducing technology into the hands of students can be overwhelming in much the same way for teachers. Besides sorting out all the apps or programs that can be used, teachers are also balancing new district initiatives, cramming through curriculum, and dealing with assessments, grading, and parents. To tackle all of this at once can become overwhelming, and many teachers are tempted to abandon the latest new thing (in this case, devices) for the things they are most comfortable with.

Changing Habits

The human mind can only handle so much change from routine and habits. During her session at the 122nd annual convention of the American Psychological Association, Wendy Woods stated, "The thoughtful intentional mind is easily derailed and people tend to fall back on habitual behaviors. Forty percent of the time we're not thinking about what we're doing." Wood went on to explain that "habits allow us to focus on other things. … Willpower is a limited resource, and when it runs out you fall back on habits."

As teachers, we can only expect to change so much of that reaction to what isn't routine. As Wood explains, everyone's will power is limited when it comes to change of habit. That said, we can make small changes in our routine and at first find places where technology "fits in." Eventually, though, using technology at just a substitutive level needs to evolve into a habit so that it can be used for deeper thoughts. That comes with sustained, supported use of mobile devices in the classroom. That also comes with an awareness of what "deeper" learning looks like.

Swimming in the SAMR Pool

Before our own mobile device initiative, I spent a couple of years researching best practices and similar use cases in education. It turned out that 1:1 wasn't a new concept at all. The state of Maine began their Learning Technology Initiative in 2001 (aka "MLTI"—www.maine.gov/doe/mlti/) and had already

experienced years of speed bumps and road blocks along their journey. One particular researcher, Dr. Ruben Puentedura (hippasus.com/blog/), had been studying the effects of technology on learning since the late 1980s. When MLTI was launched, he focused his energy and research around this statewide initiative and gathered some great data about what really makes a difference for learning with devices.

Through his research, he developed the SAMR model (mrhook.it/samr1). The SAMR model identifies four different levels of student use of: Substitution, Augmentation, Modification, and Redefinition. It was great to see use of technology synthesized in nice, easy-to-grasp levels like those in SAMR. The one drawback of the model that I always saw was that it was designed to look like a ladder, which implied that, as a teacher, you need to have your students climb to the top (Redefinition) to be successful. In reality, it was much different from that. As I began to have a conversation about this with good friend and colleague Greg Garner (twitter.com/classroom_tech), he mentioned to me that it was more like a swimming pool than a ladder. I totally bought into his thought process and ran with it, creating my own version of the SAMR model like a swimming pool (Figure 6.1) and writing two blog posts about
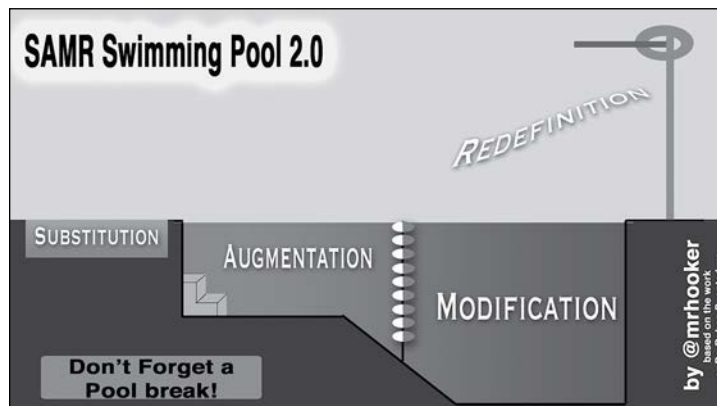

Figure 6.1 The SAMR swimming pool.

the idea.

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The basic concept aligns with SAMR in that the first two levels (Substitution and Augmentation) really fall into the Enhancement level of learning with technology. This is like being in the shallow end of the swimming pool, in that students are somewhat safe from drowning and can still enjoy the water. Technology in the enhancement level is much the same way. Students can enjoy the technology with firm controls and guidance from the teacher, but without going off on their own and "drowning" with a tool or website they shouldn't be using.

However, once you pass that pool safety rope (you know, the one with the buoys that you aren't supposed to hang onto), a lot more responsibility falls on the students to behave appropriately. Being in the deep end also means that students can do more than they could in the shallow end. As a teacher, your role shifts from someone telling them to stay in the shallow end, to someone encouraging them to try new tricks off the diving board or to touch the bottom of the pool. Just as with a swimming pool, you can see the inherent risks in doing this with technology.

Enhancement Ideas for the Classroom

In Dr. Puentedura's research, he found that most teachers and students immediately gravitated to the substitution or augmentation phase of his model when any new technology was introduced. Indeed, when we introduced iPads to teachers for the first time, one of the very first questions we got was "Are my textbooks on there?" For many schools implementing a mobile device initiative, this will be the preliminary step to get devices into the hands of students.

Although almost all textbooks are now available in digital format, they were not when we started. Even today, many of the digital textbooks are really just glorified PDF copies of the original text. Using devices solely for the sake of reading electronic versions of textbooks or doing digital worksheets is a serious misuse of their potential. That said, it is a necessary first step—dipping

your toe in the pool with technology. So although we don't want the learning to stop there, it's always encouraging to see teachers thinking in that vein.

For the next part of this chapter, I'm going to share three examples of both enhancement and transformative thinking about learning with mobile devices. Many of these examples are pulled from classrooms in my district or from districts I have visited over the years. Although I delineated the difference between elementary and secondary in the previous chapters, I'm not going to do that in these examples, and here's the reason: An idea that I share from an elementary classroom could easily be adapted or changed for the secondary classroom with some slight tweaks to content or expectations. The same can be said for a secondary lesson or concept being used at the elementary level.

Remember that at the Enhancement level, the technology is really enhancing the learning activity taking place. In some ways you can do the same activity without technology, but using mobile devices might create a slight uptick in engagement, interaction, and outcomes. With that out of the way, let's look at some examples.

Enhancement Ideas

1. Reading

As I stated earlier, one of the most common and natural ways to introduce learning with mobile devices with students is reading online. Let me start off by saying I believe that reading a physical book is still a valuable learning experience and should be a part of every home and classroom. While in some ways reading a digital book is directly substitutive (you could have students read a regular paper book), there are some features of ebooks that raise the level of learning to that of augmentation.

For example, many ebook applications allow students to highlight a word and have it defined, or read back to them to teach the pronunciation. This is a powerful tool not only for early readers in elementary school, but also for students taking on harder-to-understand text (like Shakespeare) at the secondary level. Having the book give you some context or understanding while you read it can be powerful.

Figure 6.2 Shakespeare digital book from The New Book Press. Image courtesy of Alexander Parkerand.

The latest-generation digital texts (not the glorified PDFs I mentioned earlier) even have interactive components built into the book itself to check for understanding. A recent example we've had some success with is the series of Shakespeare books produced by The New Book Press (see Figure 6.2). In this series of books, students can not only read the text on half the pages, but also watch it acted out by professional actors on the other half of the page. There are also ways to interact with the text and pull up references to certain words used by the Bard throughout his series of classics. Talk about the ultimate context experience!

2. Note-Taking and Reflection

Another great way to introduce mobile devices into your classroom is to have students use them as a tool for taking notes and reflecting on their learning. While note-taking can be done with pencil and paper, there are some limits to those notes without technology. However, we've seen examples where students (and adults) prefer to write and take notes on paper, and in some cases that may actually be better for retention, as suggested by this 2014 article from *Scientific American* magazine: mrhook.it/notes.

Of course, the downside of this method is that when the notes aren't digital, they can be lost quickly. Since most devices come with a camera attached,

encourage your students to capture their hand-written notes digitally so they have a backup if their notebook is lost or misplaced. Another suggestion for the classroom teacher is to be consistent, but also to allow for some level of personalized choice when it comes to note-taking. There are so many different tools out there, from the hand-written notes mentioned before to tools like Evernote or Google Docs that each offer their own benefits for the student.

Generally, I would recommend some sort of note-taking that is cloud-based and shareable. This way, if a student's device quits working, they can still access their notes online. Also, if there is a point during the learning process where the classroom teacher wants to see the notes (such as in secondary science classrooms), the student will have an easy way to share those with their teacher or other classmates.

One last point I'll make in this area is that note-taking in a visual form can also be powerful for learning and retention. The concept of "sketchnotes" has been a growing trend among professionals and really can help a visual learner with reflection and retention. I've started doing this as professional practice as well, and although my art still leaves something to be desired, I tend to remember more of what was said during a talk or keynote, as seen in Figure 6.3. For point of reference I used the app "Paper by 53" (www.fiftythree.com)
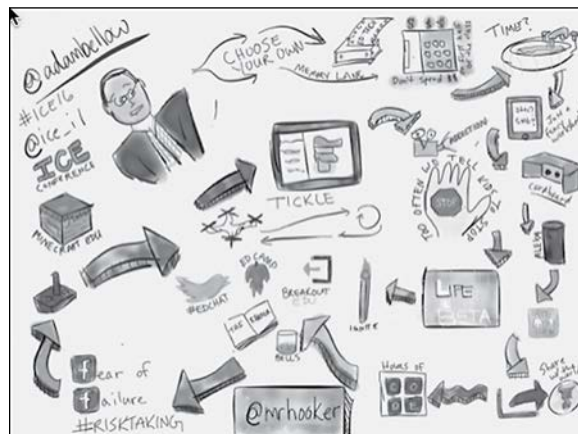

Figure 6.3 My sketchnote reflection of Adam Bellow's ICE 2016 keynote address.

here for my sketchnote of Adam Bellow's keynote at the ICE conference in February 2016.

3. Presenting Ideas

One of the last examples I'll share really starts to shift thinking from just enhancement to transformation. Although making presentations in Microsoft PowerPoint to share your information has been around for decades, there are now many more mediums to use to display your knowledge and understanding of a concept. In some ways, you could consider the idea of students presenting information in a presentation tool to be substitutive. Couldn't they also display their information on one of those trifold poster boards made famous by science fairs across the country?

Where presentations start to cross over into augmentation (and ultimately to the transformative level) is when the technology allows for tasks that you couldn't do on a poster board, and even some tasks that were previously impossible without technology. I'll give you one of my favorite examples here: explaining Latin with Minecraft.

A couple of years into our iPad initiative, we saw some immediate benefits for students presenting their understanding. Using Keynote for the iPad, students could create simple presentations explaining their thinking or knowledge of a learning objective. In Natalie Cannon's Latin class, one student wanted to try something a little different.

The task was to create a presentation (presumably on PowerPoint or Keynote) that outlined and explained the various parts of a Roman bath house in Latin. This assignment could have been done by the student in a couple of hours, but this student wanted to dive deeper and use a tool that he had become very comfortable with: Minecraft.

In case you've been living under a rock for the last several years, Minecraft is an interactive world where users can create and destroy materials one block at a time. This particular student wanted to re-create the Roman bath house to scale and then screen record his creation and do a voiceover in complete Latin. While the original task (presenting parts of a Roman bath house in Latin) could have been done without technology, the way in which this student used

technology to enhance both his understanding and that of the students (and teacher) in his class begins to demonstrate how technology can be transformative when used in the right way.

Workflow Discussion

Before we dive into some transformative ideas, one of the major differences between these two areas of learning with mobile devices tends to be the workflow. Teaching and learning in the enhancement realm very much mirrors what teaching and learning looks like in a non–mobile device classroom. The teacher is still the primary source of interaction with the students, and tasks to be completed must flow back and forth with her or him. Here's an example:

1. The teacher assigns a paper or worksheet to students and distributes this to them by asking one student to take a paper and pass the rest back.

2. Students complete the assignment using their pencils and then turn the paper back to the teacher.

3. The teacher then grades the assignment or gives some level of feedback for the student to continue working on it and hands it back to the student.

This "typical" workflow scenario would also work well in a classroom that enhances with technology, with a few minor tweaks and in some cases with the addition of a content or learning management system (LMS). In this new enhanced scenario, we see some subtle changes, but the teacher is still the focal point:

1. The teacher assigns an electronic worksheet or project to the students either via email or through some sort of learning management system where assignments can be accessed by students.

2. Students complete the assignment or task and then submit their work to the teacher to review via email, the LMS, or some sort of shared folder system such as Google Drive.

3. The teacher than grades the assignment or gives some level of feedback to the student digitally.

4. The students can then make some adjustments with the teacher's feedback and share back the final revisions.

There isn't much difference between these two scenarios, and for many reasons, that's why major LMS systems like Blackboard or Canvas have been so successful in the K–20 educational space. Those systems in some ways perpetuate the teacher-centric method of teaching with mobile devices (discussed in Chapter 4) versus a student-driven one.

Before I go any further, let me clarify by saying there are in fact times when this method of teaching and workflow is necessary. However, I do not think that you should use only this method of instruction in your everyday teaching practice, whether or not you have mobile devices.

Going Transformative in the Classroom

The third enhancement example, with the student using Minecraft, brought back memories of a similar experience I had in school, only with a different outcome. When I was in sixth grade, I was asked to do the typical "creating a step-by-step recipe" assignment. The assignment was to go home and create a recipe card based on the preparation of some sort of food item. (Step 1, take out the bread. Step 2, apply the peanut butter, etc.)

It just so happened that I had this amazing (and quite heavy) piece of technology known as a VHS camcorder. I loved making films and shows with this device as a child, and I thought rather than just making a boring recipe card, I would create my own cooking show!

With my dad as the cameraman and editor, I shot and reshot many different versions of my recipe for what I called "Carl's Famous Cookie." It was

essentially a giant sheet cookie that contained sugar, butter, chocolate chips and oatmeal, but I digress. I completed the project and brought the tape to school. I asked the teacher to find the one TV/VCR cart in the school at the time (usually located in the library) and wheel it into class for my project. With my fellow students gathered around, I proudly shared my cooking show and recipe.

The result? Thunderous applause (at least how I remember it) from my classmates! However, I then received my grade for the assignment: an "F." How could this be? I was being so innovative! Why did I get an F? The teacher responded, "You didn't follow directions." I was devastated. It would be the first and only F I would ever receive in my K–12 education, and it left a lasting effect on my 12-year-old brain. This assignment wasn't about demonstrating the steps of how to accomplish a task—it was about following directions. It wasn't about showing my learning—it was about writing down "Step 1—Take out a mixing bowl."

Figure 6.4 Carl's Cooking Show

I shared this personal story, because taking your classroom into the transformative realm of learning means a shift from the teacher's mindset. The most important thing can't be following directions— demonstrating learning must also be matter. Here are three examples where I've seen the power of learning when the teacher allows the student to drive the learning in a transformative way with mobile devices.

Transformative Ideas

1. Augmenting Reality

Augmented reality is not a new concept in technology, but the introduction of mobile devices with cameras has brought it into the classroom for the first time. This book and the Easter eggs hidden within the images is in some ways transformative. I could have never done this with a book if I had written it five years ago.

In the classroom, being able to layer elements of augmented reality onto a project can add not only a level of enhanced engagement, but also an opportunity for students to demonstrate their knowledge and understanding of a concept in a variety of ways. In my state, we teach Texas history in fourth and seventh grades. With no national curriculum to follow, this is an area where we see some innovative teaching ideas for the application of mobile devices.

One such idea came about from a fourth grade team at Cedar Creek Elementary in my district. For years, they had done the standard "book report" on a famous historical Texan. Each student would write out the report on paper, and it would then be posted onto a bulletin board or displayed around the school.

However, once each student had a mobile device, the team began to think of ways to make these historical figures come to life. Because writing is an important component of fourth grade, they didn't want to give that up, but they did want to breathe some fresh life into this project. Enter the idea of augmented reality. Before posting their book reports on bulletin boards around the school, students were asked to dress up and act out their Texas legend. Then, using the Aurasma app (the same one used for this book— www.aurasma.com), the students would overlay their video on top of an image of their subject.

Almost instantly, two things happened. First, students had to have a much deeper understanding of the figure they were studying. Because they had to act out the part of this character for the camera, they had to pick up mannerisms and accents and internalize some knowledge of what this person did that was significant in Texas history—beyond what would be needed for a written

report. Second, there was a level of engagement and motivation among the students creating these projects. They each practiced the video portion to a much greater extent because they knew these would "come to life" right off the page of their report. Dr. Puentedura's definition of Modification states that technology allows for significant task redesign. That's clearly the case in this example.

2. Using the Web to Create Awareness

Our students live in a world where accessing information on the web is the norm. However, how often are our students putting their learning on the internet? Creating a blog with a tool like Edublogs or Kidblog can be a safe and controlled way to start that process of having students publish their best work or share ideas. In some ways, just publishing to a larger audience than Mom and Dad can have a transformative effect on learning—but what if you used that platform to help with a cause or raise awareness?

Our Westlake Virtual Vietnam Project (virtualvietnam.eanesisd.net) has been a part of the learning culture in our English III classes as well as U.S. History. Students are given the assignment of researching a serviceman or woman killed in action from the Vietnam Veterans Memorial Wall on the National Mall in Washington, DC, and then tell their story.

What's immediately powerful about this project is that it causes students to think outside of their own "bubble" of existence. In a world where they may be transfixed by an Instagram post or a clever internet meme, they now realize there is a larger world out there. In the case of our high school students, they also see that many of these soldiers who died in battle were their age. Besides the emotional element of this project, students also must figure out how to contact friends, families, and next of kin, sometimes without the use of technology.

Through letters, emails, phone calls and faxes, the student then collects images and videos of the soldier for their final video story. Using a variety of technology tools (see idea #3, next), the student creates a short film that encompasses the life of the soldier and how they served our country. These films can often elicit an emotional response from both the family of the soldier and the student creating the film. With the power of the internet, video, and

collaboration, the life of this soldier becomes a truly transformative experience for the student creating the project.

3. The Power of Choice

In Chapter 4, I shared the story of a third grade assignment on the solar system. Rather than telling the students to deliver the content on a particular tool or app, she allowed a level of student choice. Much like the example of the student creating a Roman bath house in Minecraft for Latin class, giving students a choice of medium can increase their ownership over the content.

Giving students some level of choice with their devices can be powerful for ownership, and it can also lead to transformative learning. Dr. Puentedura says that Redefinition is when technology allows for the creation of new tasks that were previously unimaginable. If you are a teacher who doesn't allow students any choice or say over the process of learning in your classroom, this level of depth cannot be achieved. That said, having too many choices can also stifle learning, so the teacher needs to act as a guide and mentor for students making their choice.

Ultimately, there will be times in your classroom when students are in different parts of the pool. The student or students who have earned a level of responsibility may be allowed to swim deeper and try some new app or tool that the classroom hasn't used previously. A student who is struggling or may need more guidance can stay in the shallow end for a while until he or she feels comfortable going deeper. Some students may need to stay out of the pool altogether. The bottom line is, with your students, don't think of technology as a goal or ladder that you need to climb together. Think of it as a part of the everyday routine of learning. Like a pencil, a pair of scissors, or glue, it comes with expectations and instructions—but try to not limit what students can create if you let them explore the deep end of learning.

PART 3

Well-being and Mindfulness
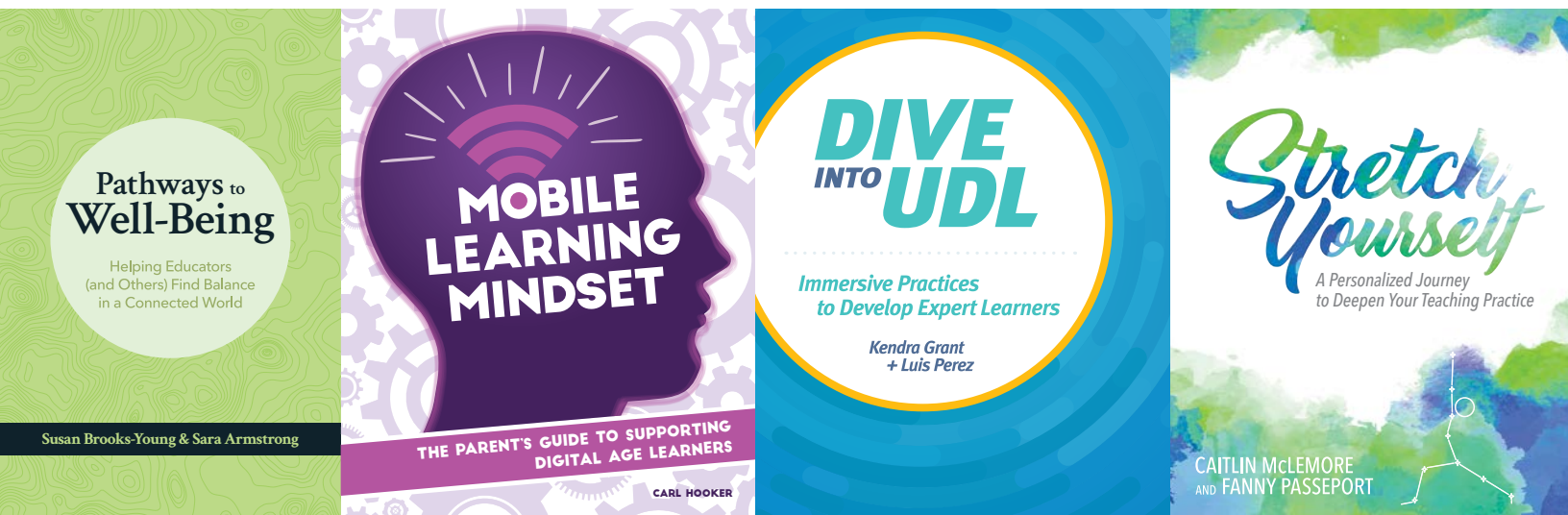
Pathways to **Well-Being**

Helping Educators (and Others) Find Balance in a Connected World

Susan Brooks-Young & Sara Armstrong

MOBILE LEARNING MINDSET

THE PARENT'S GUIDE TO SUPPORTING DIGITAL AGE LEARNERS

CARL HOOKER

DIVE INTO UDL

Immersive Practices to Develop Expert Learners

Kendra Grant + Luis Perez

Stretch Yourself

A Personalized Journey to Deepen Your Teaching Practice

CAITLIN McLEMORE AND FANNY PASSEPORT

Pathways to Well-Being

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Susan Brooks-Young & Sara Armstrong

1

Gratitude

On January 1, 2012, a young man named Brian Doyle and two of his friends had a near miss with a wrong-way driver. One year later, Brian shared his story at the TEDxYouth@SanDiego 2013 event. He explained that this near accident impacted his life in an unexpected way: For nearly a year he thought about people in his life and ways they had influenced him. Then, over the 2012 Thanksgiving holiday, he decided to say thank you to one person every day for the next 365 days. He began the next day. From his best friend to former classmates and teachers, from his parents and other family members to people he barely knew, Brian took the time to say thank you. He learned many lessons from saying thank you, but one of the most important was that people do not know how much they are appreciated by others—especially if no one ever tells them. He also reported that his focus shifted to looking for the positives in every day instead of the negative (Doyle, 2014).

9

Overview

It's no accident that we've chosen to begin this book with the topic of gratitude. If you decide to try the strategies suggested in this book, start with gratitude. Why? Personal experience has shown us that the simple act of expressing gratitude is the quickest way to increase our sense of well-being, and experts in the field agree. They identify a number of immediate and long-term benefits of experiencing and expressing gratitude, even after engaging in this practice for only a short period of time. What are the benefits, and how do you get started? Let's begin by establishing a common understanding of what we mean by *gratitude*.

People often define gratitude as being thankful for someone or something, but it is more than that. Gratitude is also people's willingness to show appreciation for kindnesses extended to them and to return or pass along that kindness in some way. In other words, initially, gratitude is experienced internally, but it is enhanced or expanded when we externally express thanks to someone or are inspired to perform acts of kindness of our own. This twofold definition is what we mean when using the term *gratitude*.

The importance of gratitude has been recognized for centuries. For example, Aesop (620–564 BCE) said, "Gratitude is the sign of noble souls," and Marcus Tullius Cicero (106–43 BCE) reportedly

WHERE TO FIND RESOURCES ON GRATITUDE

Interested in learning more about how practicing gratitude changes lives? Check out these web resources for research on gratitude:

Expanding the Science and Practice of Gratitude
(ggsc.berkeley.edu): Housed at the University of California, Berkeley, the Greater Good Science Center sponsors research and public initiatives that focus on gratitude. Access articles and other information on the website.

"Five Best Books on Gratitude + Oliver Sacks' Gratitude Book"
(positivepsychologyprogram.com/gratitude-books-oliver-sacks): Five book recommendations as well as links to additional readings on gratitude.

"Five Steps for Building Grateful Kids" (cct.biola.edu/5-steps-building-grateful-kids): This article by Jeffrey J. Froh discusses why it is important to teach kids to be grateful. It features five strategies to encourage kids to have more gratitude.

said, "Gratitude is not only the greatest of virtues, but the parent of all the others." The positive benefits of practicing gratitude are numerous. For simplicity's sake, we have classified benefits into three areas: physical health, mental health, and social health. Let's take a brief look at benefits in each of these categories.

Physical Health

Robert A. Emmons, PhD, author and professor of psychology at University of California, Davis, focuses on gratitude in his work. Based on results of several studies, Emmons' research team found that people of all ages who nourish feelings of gratitude see health benefits in as little as three weeks. These benefits include: a more robust immune system; reduced risk of heart disease due to physical changes such as decreased blood pressure; less stress; and fewer aches and pains in general (Emmons, 2010).

It also appears that people who feel grateful take better care of themselves. For example, they are more likely to exercise regularly and have healthier diets. These people also sleep more deeply and feel better rested on waking.

Mental Health

Dr. Emmons and other researchers identify several ways gratitude improves individuals' mental health. For example, people who show gratitude experience an increase in their sense of personal happiness at home and at work while also reporting a decrease in emotions such as envy, depression, or anxiety (Emmons, 2010). Similar findings were identified in two studies that focused on expressing gratitude in writing, for example by journaling or writing a letter. The subjects of one study were health care practitioners working in high stress environments while subjects of the second study were people participating in therapy. Participants in both studies reported decreased mental stress and increases in their mental health after keeping gratitude diaries or journals or, in the second study, writing letters of gratitude (American Psychiatric Association, 2017).

There are additional mental health benefits connected to gratitude. They include increased optimism, better performance both professionally and academically, and a greater ability to cope with difficult circumstances. In fact, a team of researchers led by Dr. Barbara L. Fredrickson was exploring a hypothesis that positive emotions foster

resiliency when they tested a group of college students in early 2001 to measure the level of positive emotions they expressed—including gratitude. These same students were tested in the weeks following the 9/11 attacks in New York City. In analyzing students' pre- and post–9/11 scores, researchers found that those participants who had expressed higher levels of positive emotions, including gratitude, were less likely to experience depression or other negative emotions following the events of 9/11 (Fredrickson et al., 2003).

Social Health

Based upon the give-and-take nature of fully expressed gratitude, researchers at UC Davis identified a connection between gratitude and a person's social health. For starters, people who are grateful also tend to be empathetic—very good at putting themselves in someone else's shoes. Along with their ability to empathize, grateful people tend to have a strong sense of community and believe they have a responsibility to care for others. These characteristics lead to positive outcomes, including:

- **Deep friendships**

- **The ability to be good team players**

- **Strong family relationships**

- **Willingness to help others**

- **Strong sense of community**

The Real-World Connection

Americans' levels of optimism and happiness have been declining over the last few years. An Allstate/*National Journal* Heartland Monitor Poll conducted in 2015 asked participants how six current social and economic trends in American society impacted their general feelings of optimism or pessimism. While two of the trends made them feel more optimistic, participants reported that the remaining four trends left them feeling increasingly pessimistic (Brownstein, 2015). Additionally, America's ranking in the international World Happiness Report has fallen for the second time in two years. In the 2018 report, America fell from 14th to 18th in the report's ranking of 156 countries from

around the world (Horton, 2018). The good news is that individuals can make small efforts to recognize what they have to be grateful for and move toward more positive feelings and actions. The better news is that one person can encourage others, both directly and indirectly, to spread feelings of gratitude throughout their own spheres of influence.

A classic example of this phenomenon is found in Eleanor H. Porter's time-honored children's novel from 1913, *Pollyanna*. An orphaned child (the title character) comes to live with her aunt, who is a cold, unhappy person. During the course of the story, Pollyanna changes not only her aunt's view of the world but that of many townspeople through her ability to express gratitude and practice kindness. The profound impact of these changes is realized when Pollyanna is temporarily paralyzed following an accident and those whose lives she has touched rally to help her find the good in this terrible event.

A bit corny, perhaps, but intentional focus on expressing gratitude helps not only the individual but everyone with whom that person interacts. Just one person can influence others by practicing gratitude quietly and consistently. In turn, those who pick up on this "attitude of gratitude" will influence their families and friends as well. Give it a try!

Technology and Gratitude

The idiom "keeping up with the Joneses" comes from the title of a comic strip created by Arthur R. Momand and published in several U.S. newspapers from 1913 to 1938. The strip depicted the lives of the McGinis family, who measured their own level of social and material successes by comparing themselves to their neighbors, the Joneses, who never actually appeared in the strip. Needless to say, the McGinises continually struggled to measure up (Pritchard, 2013).

Being envious of others is part of the human condition, but it is also fair to say that since the early days of readily available, inexpensive print materials, mass media has helped intensify these feelings of jealousy. Technologies—including movies, radio, television, and now the internet—make it even easier to experience discontent with our lives. Although the internet alone cannot be blamed solely for anyone's sense of dissatisfaction, it is reasonable to acknowledge that all forms

of media can contribute to a person's discontent when not viewed with a critical eye.

Why does this happen? There are exceptions, but most people who post on social media do not air their dirty laundry so publicly. They usually focus on the high points in their lives—vacations, weddings, holiday celebrations, and so on. These upbeat, on-top-of-the-world messages can give readers the sense that their own lives are not nearly as positive or rewarding as those of their friends; this can lead to lower self-esteem and a sense of dissatisfaction (Barr, 2018). Instead of being grateful for all the good things and people that are already part of their lives, they develop resentments about what they think they should have, but do not.

The way to combat the drive to keep up with the virtual Joneses is to step back and think critically about what's happening and why. Here are a few things to try with social media feeds and other online accounts.

1. **Unfollow people who arouse jealousy.** You know who they are. No matter what they write about, you end up feeling inferior because you believe your life will never measure up to theirs. It does not matter if others consider these people inspirational—if you do not, unfollow them. Whether it's people you know in real life or online, they'll never know you are not reading their posts, and you will feel better.

2. **Follow people who inspire you,** people whose posts lift you up or offer content that resonates with you. Perhaps they have expertise in something you'd like to learn more about, or they handle life's ups and downs with humor and grace. Whether they make you smile or get you thinking, these posts will not invoke the green-eyed monster.

3. **Log out of your social media accounts.** Did you know that the average person spends 116 minutes on social media per day? That's nearly two hours! (Asano, 2017) If you're feeling overwhelmed or like you can't keep up with everything you need to get done, this may be a contributing factor. We're not suggesting that you give up social media, only that you make it a little more cumbersome to check your feeds. When it takes a mere click of a button to peek at Instagram, Facebook, Twitter, LinkedIn, or

whatever social media platforms you use, it's all too easy to fall down the social media rabbit hole whenever you get bored. Simply spending less time reading posts can lift your spirits.

4. **Turn off notifications.** If you cannot bring yourself to log out of your accounts, at least turn off notifications. It's nearly impossible to ignore the Facebook Messenger chime or the ding that lets you know someone has liked or retweeted one of your tweets or sent you an email.

5. **Spend more offline time with people.** Social media is not a replacement for face-to-face relationships. Yes, you still might make unrealistic comparisons of your life to the lives of those around you, but real-life encounters include visual and aural cues that help you maintain a better perspective on interactions.

6. **Fight the Fear of Missing Out (FOMO).** When a post you see online makes you feel as though you are missing out because you do not have (or have not done) something, take a moment to think about your reaction. Specifically, what are you feeling and why? If you can name the emotions you are experiencing and figure out why they bother you, it's possible to change your focus from what you do not have to what you might want to do.

Can social media and other technologies be used to enhance your sense of gratitude? Absolutely! For example, you can:

1. Use digital photos and a collage-maker app to create a virtual poster of people, places, or things you are grateful for. Use it as wallpaper for your laptop, smartphone, or tablet.

2. Subscribe to blogs or sites that suggest daily practices for expressing gratitude, and implement suggestions that appeal to you.

3. Use email or messaging to reach out and thank someone.

4. Make a video call using FaceTime, Facebook Live, Skype, or another video-calling app to connect in real time with someone and share a little gratitude.

5. Make a gratitude video to share with family and friends.

Technology does not replace face-to-face relationships, but it can be used to enhance them.

Activities

Here are several activities you can choose from to help you focus on gratitude. Some work well for personal use (e.g., the gratitude journal), while others are great for group use (e.g., the wall of gratitude). The first six activities can easily be used with kids in a variety of settings with little or no modifications. In addition, the sidebar includes web resources that can be used to enhance activities 1 and 2.

1. **Gratitude journal:** One tried-and-true activity is keeping a gratitude journal. Use each entry to identify three things for which you are grateful. These can be stated in broad terms, such as "my health" or "my family," but they may also identify very specific things, such as "completing my project on time." Take a few minutes to explain why each item listed inspires your gratitude. Research shows that weekly writing is enough to increase a person's sense of well-being, but more frequent entries have an even greater impact. Daily journaling is optimal.

2. **Gratitude displays:** You've probably heard of vision boards that people create to illustrate what they want in their lives. Instead of focusing on what you want, create a display that illustrates all the things and people in your life you are grateful for already having. It might be a bulletin board, a poster-board collage, or a collection of knick-knacks that hold special meaning. Whatever it is, surround yourself with images or objects that remind you of specific reasons for your gratitude.

3. **Gratitude jar:** Each morning, write something for which you are grateful on a slip of paper, and drop it into a decorative jar or box. Those days when you're feeling a little down or cannot think of something to write, take a few slips from the jar and read them to spark an idea about something you can be grateful for that day.

4. **No complaints:** Imagine that 48 terrific things and two negative things happen during your day. Do you focus on the fact that 96% of your day was great, or is your attention riveted on the 4% that did not go so well? If you're like most people, you pay greater attention to the negative. Of course there are times when negative events supersede the positive, but most negative occurrences consume our attention because we have taught ourselves to ignore the positives in our lives. One way to develop an attitude of gratitude

is to break this habit by declaring "No Complaints" days. Vow to spend a day focusing on what's right with your life, not what's gone wrong. At the end of the day, reflect on how you feel. Do you notice a difference?

5. **Thank-you notes:** A heartfelt verbal thank you covers many occasions, but there are times when more formal acknowledgment is needed. Most people appreciate the extra effort required to write a thank-you note, address and stamp it, and drop it into a mailbox. The next time you want to let someone know you are grateful for

Activity ❶   GRATITUDE JOURNALS: Online Tools

- **Penzu Online Journals** (penzu.com/gratitude-journal): Penzu offers free, secure online journals for a variety of uses. Optional mobile apps make your online journal available on any device. The website discusses gratitude journals, their purpose, and tips to get started. There are also links to templates for readers who prefer recommended formats.

- **Online Word Processors:** Tools such as Google Docs (docs.google.com) or Microsoft 365 (office.com) are also fine for keeping private journals. You can create your own format or look at the templates linked to the Penzu journal tool above to get some ideas.

- **Kids' Gratitude Journals:** If you ask kids to write gratitude journals, you'll need to consider privacy issues and use composition books instead of writing online. Of course, if your school is a GAFE (Google Apps for Education) or Microsoft 365 school, students younger than 13 have permission to use online word processors.

Activity ❷   GRATITUDE DISPLAYS: Online Tools

In addition to the gratitude display formats suggested in the first activity description, you might consider a digital display. There are several tools that make it easy to create and share digital posters that include text, images, audio and video. Here are a couple tried-and-true online tools:

- **Poster Maker** (postermaker.com): This free basic tool allows you to create posters using clip art provided or upload your own images. You may save an image of your poster to print or share online.

- **ThingLink** (thinglink.com): Free and premium accounts available. Use ThingLink to create hyperlinked digital posters; add text, audio, video, and images to enhance the display.

something he or she has done, take the time to write and mail—or even hand deliver—a note.

6. **Volunteer:** Giving back to someone else is a meaningful way to express gratitude for being in a position to help someone else. There are innumerable ways to help others, from occasional activities (such as hosting food drives) to ongoing commitments (such as leading youth groups or visiting homebound neighbors). Even when your time is limited, opportunities to be helpful are plentiful; you only need to recognize and act on them.

7. **Practice self-care:** Self-indulgence is the excessive gratification of personal desires—behavior that is not particularly admirable. Self-care, on the other hand, consists of activities designed to increase our health and well-being. Taking care of oneself is an inward expression of gratitude, a way we can demonstrate self-respect and esteem. Think about things you already do that fall under the category of self-care. Is this a regular practice for you, or could you up the ante a bit? If possible, do at least one kind thing for yourself on a daily basis.

8. **Brighten someone's day:** Have you ever worked a job where you relied on tips to earn minimum wage? We have! As a result, we tend to be very generous when tipping wait staff, cab drivers, and others who depend on tips to make a living. Of course, a "thank you" is always appreciated, but—when appropriate, and if you can afford it—a substantial tip can make a big difference in someone's day.

Questions for Reflection

1. What role does gratitude play in your sense of well-being?

2. What daily acts of gratitude can you cultivate in your life?

3. How do you currently express gratitude to family members and friends?

4. What is one way you can use technology to express gratitude to yourself or others?

5. What will you do today to express gratitude to yourself or others?

Additional Resources

"Gratitude: The Most Effective Social Media Practice," Carol Bush, February 1, 2016. thesocialnurse.com/gratitude-the-most-effective-social-media-practice

"In Praise of Gratitude," *Healthbeat,* Harvard Health Publishing, November, 2011. health.harvard.edu/newsletter_article/in-praise-of-gratitude

Making grateful kids: The science of building character, Jeffrey Froh and Giacomo Bono, 2014. West Conshohocken, PA: Templeton Press.

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ISTE Standards Connection

ISTE Standards for Educators 3a: Create experiences for learners to make positive, socially responsible contributions and exhibit empathetic behavior online that build relationships and community.

ISTE Standards for Education Leaders 1c: Model digital citizenship by critically evaluating online resources, engaging in civil discourse online, and using digital tools to contribute to positive social change.

ISTE Standards for Education Leaders 3d: Support educators in using technology to advance learning that meets the diverse learning, cultural, and social–emotional needs of individual students.

When adults regularly talk with children about the differences between life as depicted in the media and in the real world, they are able to help them remember that television, movies, social media, and other forms of online entertainment are not necessarily accurate representations of how most people live. Educators and others who work with children are uniquely positioned to help them use online resources and digital tools in healthy, responsible ways.

MOBILE LEARNING MINDSET

THE PARENT'S GUIDE TO SUPPORTING DIGITAL AGE LEARNERS

CARL HOOKER

The following excerpt is from this book.
Check out the complete book at iste.org/MobileLearningParents

HOUSEHOLD GUIDELINES

"I'm just sick and tired of fighting with my kids and their technology."

This is a statement I have heard over and over throughout my years of facilitating parent workshops and discussions. There is this feeling in many households that there needs to be a "fight" or "battle" when it comes to kids and technology. This battle can happen in other arenas, too (in my household, getting kids to bed on time), but generally technology seems to be viewed in this light—partly because it's new, and partly because we as parents don't quite understand the use or entertainment value of the devices or social media sites.

A big reason to put some sort of shared guidelines in place sooner rather than later is that they help avoid those battles. Without agreed-upon guidelines and rules, you might find yourself in the following scenario.

Over-gaming Scenario

Your son is playing his video game and not doing his homework or chores. You try and approach it calmly at first and say, "Hey, son, I know you are having fun playing that game, but could you wrap it up and finish your home-work and chores first?"

By asking it like a question, you empower him to respond with a yes or no and give him some level of control of the situation. However, you also run the risk of him saying "just a minute," and then continuing to play for hours.

A more strict (and even less effective way) would be to say, "Hey listen, I don't understand why you keep goofing around with that silly game. You *know* you have work to do, yet you make the poor choice of playing that game instead. Stop procrastinating and turn that thing off before I throw it out the window!"

In the above scenario and final response, you have effectively thrown in judg-ment and a fake consequence to solve a problem. You may think the game he is playing is silly, but he obviously feels it warrants his attention much more than homework and chores. Also, saying you'll throw his device out the window relays your anger, but again, it's something you are unlikely to do (hopefully).

One of the things I've stressed over and over in this book is the need to have constant communication with your child about their activity on their devices. In the next two chapters, we'll go into some rules and also restrictions that you can put in place to help curb their inappropriate use. Please know that no set of rules or restrictions can replace honest discussion and conversation with your child. I'll also throw in some more scenarios like the one above and give some options for responses. Please know that every situation and every child is different, so the scenarios and guidelines I offer are suggestions and not hard-and-fast rules to follow.

The 24-Hour Rule

Before we discuss some guidelines and ideas for creating them, I want to mention an idea that a few parents I've been working with recently have deployed in their house with some success. It is actually a process very similar to what the Federal Aviation Administration (FAA) puts in place for their air traffic controllers. Whenever a mistake is made or a potential mishap is avoided, the FAA puts in place a 24-hour rule of protection for the person making the mistake. What this means is that if someone makes a mistake but then reports it within 24 hours, they will be free of traditional punishment. The rationale behind this rule is that if people share and learn from the mistake, it will make all other air traffic controllers more aware and responsive, potentially avoiding major disasters down the road.

In the case of our kids, we can deploy a similar rule. Kids will make mistakes in life whether it be virtual or real. We want them to learn from their mistakes but can't help them if they hide them from us. Having a rule of 24-hour protection to report an inappropriate finding or action encourages our kids to talk to us about things they come across and also learn from their mistakes before making potentially greater mistakes down the road. Here's a scenario:

Stumbling across Inappropriate Material Scenario

While doing research for a project on rainforests, your 10-year-old does an image search for "rain" which inexplicably brings up images of a partially nude night club dancer who goes by the same name.

Without the 24-hour rule:

Your child is somewhat curious about the photos but also knows they shouldn't be looking at them. Rather than tell you, they continue to look through the web and click on links that turn out to be spam. A few days later, their computer becomes infected, at which point they confess to what they were doing and hand you a hefty computer repair bill.

With the 24-hour rule:

Your child is somewhat curious about the photos but also knows he/she shouldn't be looking at them. They know they are inappropriate and also know you have a 24-hour rule about mistakes being made on the internet or in real life. He/she brings it to your attention, at which point you can have a discussion about what they saw and also talk about "phishing" sites and how viruses/spam can come from such places. The computer isn't affected, and you figure out how to put on a stronger image filter to avoid future missteps.

This scenario is tricky because some of the damage has already been done by the child seeing the inappropriate image. Much like the case of the FAA, at that point you are in damage control and adjustment mode. However, if your child doesn't tell you, under the protection of the 24-hour rule, the range of possible outcomes continue to get worse. If your child reveals what was discovered immediately, you can have an on-point (albeit somewhat uncomfortable) conversation about what your child saw and also make necessary adjustments to filters and image searches to avoid it happening again in the future.

The 24-hour rule is a great general rule to put in place in a household—but know there might be the occasion when it has to be broken, especially if a child or teen starts to abuse it. Knowing there is freedom from consequence could cause them to test their limits more often and then tell you about it after the fact. The basis for the 24-hour rule is that there are consequences for every action, but the severity of those consequences is made greater by your child keeping it from you.

Purpose of Household Guidelines

Regardless of what rules and guidelines you decide to put into action in your household about technology, devices, and social media, you should always evaluate those rules as an opportunity for growth more than punishment. Just like the 24-hour rule, this can often lead to some difficult conversations—but remember that a hard conversation now can help your child make a better decision later in life.

One of the other purposes of household guidelines is to strive to have your kids self-regulate and monitor their actions online. You shouldn't feel like a hawk constantly circling around your child when they go online or chat with someone via social media. While you should still be aware of what they are doing in general, you need to also encourage them to make the right choices. Once they leave your house after high school, they will have to make those choices completely on their own at that point. If you hand-hold them for too long throughout their teen years, they won't be accustomed to self-regulating bad behavior or making correct choices on their own.

Shared Ownership and Scenarios

When you set out to create rules of the household (whether it be for technology or not), you want to include your kids in this process. If they have some early say in the brainstorming phase of rule creation, they will be more likely to follow the rules and adhere to the consequences of breaking them. This brainstorm process can also be a covert opportunity to discuss the rationale behind certain social media tools or the actions of your child (and his/her friends) online.

In collaborating with your child, be thinking and discussing possible scenarios that they might encounter and how they would handle these. Going through scenarios can help unearth some ideas about rules and consequences for negative behavior or breaking the rules.

Here are a few scenarios to think about with your kids and some possible ideas for rules or guidelines about the behavior.

Screen Time Binge Scenario

Your child is going on a marathon of television watching, YouTube viewing, or gaming. You know that this isn't good for their brain, eyes, or health, so you try to intervene.

Without household guidelines solution:

You can either let them continue on the binge and suffer the guilt of letting them do it, or you can make them stop. Making them stop involves the potential of a meltdown and also a fight or argument, as they don't understand why you are doing this to them.

With household guidelines solution:

Knowing that screen time can be an issue, you and your child create a rule where every 30 minutes they have to take a 5-minute break. They are also not to go over 2 hours of viewing in a day without a significant break or other activity.

By creating the rules ahead of time with your child, you have set in place some agreed-upon terms. Additionally, you could add in some consequences if they choose to break the rules and continue the inappropriate action. Just like the creation of the rules, the consequences should be decided on together. You'll find that often your child may come up with harsher consequences than you! In the screen-time scenario, a consequence might be the loss of "entertainment-based" screen time in the next 24 or 48 hours. Having the mutually created rule in place helps avoid potential clashes and arguments and helps your child self-regulate their screen time more effectively.

Drama has always been a part of growing up, especially in middle school. Technology has amplified the ease with which drama can grow and has taken away an emotional and empathetic element of it, as people are now just words and emojis. These are extremely hard for your kids to avoid once they own a device. It might be Snapchats or texts or tweets—regardless, there are times when they will get pulled into these conversations and not even know it. There are other times when they might instigate it.

While having a general rule or guideline about this behavior is advisable, this is one case where the action isn't quite so black and white. Rather, this is an opportunity to have a discussion and lend some guidance to your child about how they should respond and gracefully exit a drama session over text messages. The good news is, by putting some household guidelines in place, that discussion can take place well before anything like this actually happens

and when less emotion is involved, as that can cloud judgment and increase frustration.

Guidelines like "no texting at the dinner table" and "treat others with kindness and empathy" can help steer your child in the right direction. In our house we have a simple rule—"If you don't have something nice to say, say nothing at all."

Group Texting Drama Scenario

Your middle school daughter is a part of multiple texting chains with friends. This starts after school ends and carries through dinnertime. These aren't school-related texts and are actually all about creating drama with other friends.

Without household guidelines solution:

You tell her to get off the phone, especially at dinner. A struggle ensues, at which point you take the phone away and say she can get it back in the morning. This causes additional drama, as she now feels left out of the conversation with her friends.

With household guidelines solution:

Working with your daughter ahead of time, you've discussed when it's appropriate to text with friends and what the content should be about. In this scenario, both time and content are inappropriate, and she already knows that those are important in the rules you created. She tells her friends she's off to have family time and tries to steer them into a more positive direction away from the drama.

The Reality TV Star Scenario

Your teenage son has decided that he wants to be the next reality TV star, so he creates his own YouTube channel that involves him blowing things up in creative ways. He makes videos regularly and posts them almost daily. In the comment threads, people suggest he blow up his mom's car, which he considers.

Without household guidelines solution:

You know he enjoys blowing things up but are concerned about his health and the amount of destruction he's causing. Add to that the social media layer and the fact that his "Blow Up Boy" channel is now popular, and you face an almost insurmountable scenario. Ultimately, you tell him to remove the channel and to stop blowing things up, which cause him to have a fit of rage about the fact you've taken away his creative outlet.

With household guidelines solution:

There's a rule in place about being respectful of your own and others' personal property. Knowing this and your son's need to be hands-on and share, you encourage your son to create a Do-It-Yourself channel where he takes common items and "remixes" them into something cool and useful. His "DIY Boy" channel takes off. Your agreed-upon rule about "oversharing" also kicks in here, and he decides to post a show weekly that is well-produced and planned.

This is obviously an extreme scenario, but one thing I'll mention now is that all the scenarios I've listed in this chapter are loosely based on things I've actually encountered. Compared to our childhood, kids today can easily be published and viewable to the entire world via a blog, YouTube channel, or other means. Having a voice and confidence in their work can be a powerful learning mechanism if done for good rather than destruction, as in this scenario. What might start out as a cute kid blowing up stuffed animals with firecrackers can quickly go downhill. Aided with an online audience, it almost becomes addicting to the child as well, which creates another set of challenges to overcome as a parent trying to steer him in a more positive direction.

This scenario also highlights the fact that whatever rules or guidelines you put in place, they shouldn't be stagnant. If you created household guidelines before little Johnny became obsessed with explosives, then you should add or amend the guidelines when you notice this becoming a problem so he has some say in what is right and what is wrong.

Again, I cannot stress enough the importance in creating these guidelines ahead of time and also inviting your child to help you create them. With his input, you might decide that some rules like "Thou shalt not destroy property" need to exist. You might also decide that rules like "We only post positive

messages/videos online" or "We will not overshare online" need to be put in place as well for the family.

Texting Immediacy Scenario

Your 11-year-old daughter has just gotten her first cell phone and is respectful of the texting rules of the house. She doesn't text all day and night, nor does she start drama. However, she's run into a problem where she expects immediate feedback from friends when she sends them a text. She sends one friend a message and when she doesn't get a response, she sends several other messages over an hour's time and eventually starts to cry because she thinks her friend is ignoring her.

Without household guidelines solution:

This baffles you as a parent, and you aren't quite sure if there is a problem with the friend or not. You tell your daughter to be patient, but she's already beside herself. You end up calling the parent of the other child, only to learn that they have a "no texting during homework or dinner" rule in their house, which is why she wasn't responding.

With household guidelines solution:

Teaching empathy can be a hard thing for teens or tweens. They sometimes get so wrapped up in themselves that they can't imagine what the person on the other end of the line is doing. Knowing this, you work with your daughter ahead of time and create a guideline before she gets her cell phone: She needs to not only be respectful of her friends' rules, but also empathetic to their actions and not jump to conclusions.

This is a scenario that a close friend of mine stumbled on. It wasn't something she had considered, but in a world where immediacy of communication seems to be commonplace, there are emotional repercussions to not getting immediate feedback. When our kids are young, we stress the importance of others' personal physical space. We also need to know be cognizant of their personal virtual space and have a sense of awareness that not all kids follow the same rules or have the same access as others.

Keeping the Guidelines Positive

I could write an entire book based solely on scenarios. I mentioned a few here to get your mind thinking about things you might encounter or may have already encountered. After you've discussed the scenarios with your kids and brainstormed ideas around how to handle specific situations, you should then work on making a set of actual guidelines.

For the sake of your sanity and also to make these rules easier to follow, I would suggest limiting the household rules to no more than 10, and if possible, try to whittle it down to 4 to 6 rules. One way to do this is by grouping some rules into a general rule or guideline. Having two rules that say "No screen time after 9 p.m." and "Limit binge watching to no more than 2 hours with breaks" can be combined into a single rule that states, "Be aware of screen time and its effect on my mental and physical health."

Keeping the rule more general doesn't take away from the discussion or brainstorming of scenarios behind it. Also, giving it a more positive spin rather than saying "Limit your screen time" makes it more impactful and easier to adhere to. A child choosing to break that rule does so knowing that it's affecting their brain and decreasing physical movement because it's stated in the rule.

Some other good ones I've seen used include:

"Technology and online behavior are always out in the open." (helps to keep devices out of from behind closed doors and also opens up what they are posting online)

"I'm respectful of others' time and traditions." (helps with empathy about restrictions others may have and also not texting/calling at all hours of the night)

"Be kind to others." (helps with both online and real-life behaviors)

"Be positive with my words and actions" (keeps drama to a minimum as well as potential bullying or shaming online)

"Be honest, open and own my mistakes." (encourages them to take risks, but also to engage in conversation when a mistake happens)

Signing on the Dotted Line

There are thousands of these kinds of rules available on Pinterest or through web searches. However, I'd caution you against taking that clever teakwood sign with chalk and posting it as a work of art. These guidelines should be malleable and amendable in the future. Also, they are to be created and agreed to by *everyone* in the family. So, when you make the poster, have everyone sign on the bottom line like a contract. You can refer to this signature in the future should a rule ever be tested or challenged—because it will be.

PARENT TOOLKIT

Creating a Household Guidelines Agreement Poster

Purpose: Hang a poster with agreed-upon household guidelines for technology and life behavior

Apps/tools: Poster paper, chalkboard, or whiteboard

Setup: Go through some scenarios with your kids and brainstorm ideas for rules and consequences. Group these rules into a more general set of guidelines with a positive spin and write them on the poster. Have everyone in the household sign the bottom.

You know it's a success when: Your family avoids potential pitfalls of negative online and social behavior. You find yourself arguing and battling with your kids less and less about their actions with devices, technology, and social media. Your whole family grows closer, communicates more, and learns from each other's mistakes.

TOOLS FOR PARENTS

Although I've interspersed many different ideas throughout the book and in the "Parent Toolkit" sections, I know that parents also want other tools and hardware at times to help them monitor their kids and keep them safe. I purposely saved this chapter for much later in the book because I believe the best tool for parents in combating inappropriate use of technology or online behavior is their presence and communication. However, it's also useful to have some tools in place not only to help protect your child from encountering inappropriate content, but also to monitor their actions online.

As with any technology tool, these are constantly being updated, changed, or rendered obsolete. One rule of thumb that I preached early on in my career was having a strong filter on a family computer that was placed somewhere in the center of the house. Now with mobile devices and 4G internet, there are times where no internet filter is being accessed and the "computer" can go anywhere.

Thus, while some of the restrictions and filters in this chapter are specific to a tool or device, be aware that they are ever-changing. Also, as the tools for restriction change, so do the tools for getting around the restriction—which is why we spent several chapters going over scenarios and the hard conversations that need to take place with you and your child.

Caution: These tools *do not* replace parenting.

Tools for iOS Users

Being the director of a 1:1 iPad implementation, I have a heightened sense of awareness when it comes to all things iOS. That coupled with the fact that of the kids in our community who own a phone, 80% have one from Apple. The tools and restrictions mentioned in this section are based on the most up-to-date (summer 2016 as of this writing) tools in the current operating system. As those will change over time, I'll also include some links to resources and places to go to find more information in these areas.

App Management Strategies

One of the biggest concerns we discovered early on was that some students spent a great deal of their screen time on non-instructional or entertainment-based apps. Although we could restrict certain categories, it becomes an almost futile effort to block everything that a child may or may not download. Some of these strategies are iOS-specific, but many of them also exist in some form on other mobile-device operating systems.

In-App Purchases and Credit Card

There's nothing more distressing as a parent than to receive a $200 iTunes bill because your child has downloaded hundreds of different cake toppings for her virtual Hello Kitty cake at 99 cents each. (Hand raised here as a parent who has experienced this exact scenario.) There are two things you need to know about your child's iTunes account: You can (and should) manage the account, and you shouldn't tie a credit card to it. This can be done by "purchasing" a free app when you first create the account and choosing "none" as payment type.

If your child wants to purchase an app or song, you can have them load in credit via iTunes gift cards so they have a set amount that they can manage. If for some reason you do decide to tie a credit card to the account, I'd highly recommend going into restrictions (mentioned below) and turning off the "In-App Purchases" option. This will help you avoid any surprise $200 Hello Kitty cake bills in the future.

Age-Level Restrictions

The Apple iOS operating system comes equipped with a powerful built-in restriction option. This option, when enabled, allows you to control whatever content is coming into the phone regardless of internet filter (Figure 8.1). One word of advice here is that when establishing a restriction passcode, make sure it is one that your kids
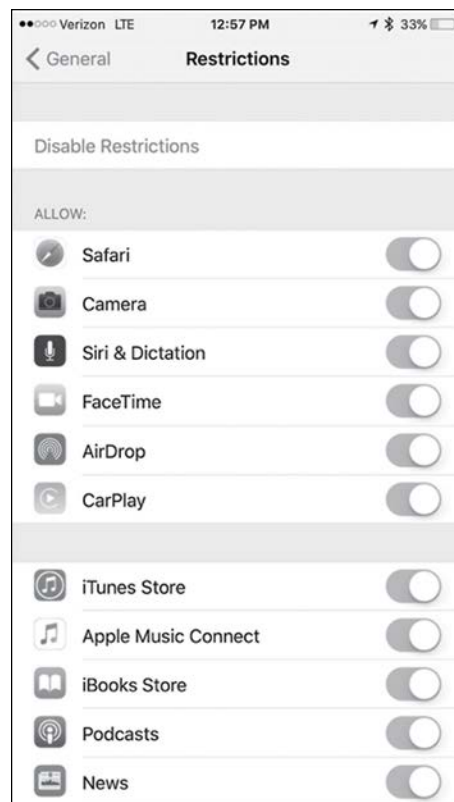

Figure 8.1 Some of the items you can turn off on your phone.

will not know, and also realize that this code is different from the passcode lock of the phone itself.

Going into the general settings and enabling restrictions presents you with many options. You can choose whether or not you want your child to have access to the iTunes store or music. You can turn off the ability to get on the internet at all (Safari) and investigate different restriction options for content. The restrictions for allowed content (Figure 8.2) can be as conservative or open as you feel your child is able to manage.

ALLOWED CONTENT:	
Ratings For	United States >
Music, Podcasts, News & iTunes U	Clean >
Movies	PG >
TV Shows	TV-PG >
Books	Restricted >
Apps	9+ >
Siri	Restricted >
Websites	Restricted >

Figure 8.2 Some examples of restrictions place on a student's device.

In our mobile device program, we limit access to many sites early on in a child's educational career, but then slowly open up and allow more content as a child matures. The goal is to have them prepared for the adult world when they leave both our doors and yours. Keeping heavy restrictions on them until they are 18 years old can actually inhibit the development of their own self-control and self-regulation.

There are times when you or your child find an app that might be appropriate, but it carries a higher age restriction for whatever reason. Apps with built-in web browsers (other than Safari) generally always carry with them a 17+ age restriction because the built-in web browser on an app isn't filtered like the Safari app. Also, apps like Facebook carry a 4+ age rating, but to hold a social media account, the user must be 13+ in most cases. So they can download the app, but can't (and really shouldn't) use it until they are of proper age.

App Self-Regulation

Even with these restrictions in place, a child could still download thousands of apps onto their device. Some parents I've worked with have put a rule in place where a child can only have a set number of non-instructional apps on their device. Since these devices are used for learning but also entertainment, kids should be striving for a balance between the two worlds.

If you feel like your child needs heavier monitoring on this front, you could turn off the ability to purchase and/or download apps in the restrictions settings. This means any time that a child needs an app, they have to ask you for permission and the restrictions passcode.

As that method is time consuming, it does give you some semblance of control. A more effective option I have discovered is that instead of turning off the ability to download apps, you turn off the ability to delete them. This would be helpful if you want them to have the ability to download whatever apps they choose, but also want to see what they've downloaded. It also reduces the amount of time they spend asking you to download apps for them, and increases their awareness of how many apps and what kinds of apps they have on their phone, as they can never delete them.

It also says you trust them to make the right choices, but lets them know that if they mess up, they can't hide it.

Website Restrictions

All iOS devices come with a built-in tool to filter web traffic and content. Making adjustments to this restriction only affect web traffic on the Safari app, so if your child has a different browser such as Chrome or Opera, they can still get around the filters. One other word of caution before venturing down this path: It is not a perfect system. Sites that you might consider appropriate, like a student blog, might come up as filtered if you select the "Limit Adult Content" option in the website filter settings (Figure 8.3).
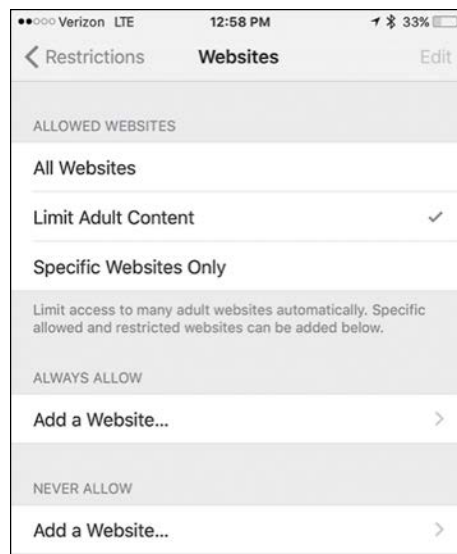
Figure 8.3 Website filter feature.

When this setting is enabled, if a child is surfing the web and comes across a blocked site, they have to enter the restriction passcode to add it to the "allowable" list of websites. At this point they would have to bring you their phone and ask you to enter the restriction passcode you chose when you set up the restrictions. Only then will they be able to access the site.

Furthermore, you could enter an even more extreme mode of web filtering by allowing only specific websites. This could be potentially time consuming, but for a child who likes to surf and get into mischief online or for one who is having a hard time concentrating on a project or assignment, it's a handy resource to have in your back pocket.

iMessage Sharing and Forwarding

As was mentioned in some of the Chapter 7 scenarios, text message exchanges can involve a lot of drama. Phone bills can tell you when texts are being received and sent, but not the content of those messages. If you want to view these as a parent, you need to have access to your child's Apple ID, and then you can see what is being sent between iPhones. (Note: If it's to another type of phone, it will only be a text message and will not be viewable via a shared account.)

By going into message settings, you can see what accounts are set up to send and receive. The Apple ID listed in there is the one you'll want to put on your device. You can have more than one email and Apple ID on your own iOS device, so this won't disrupt any messages you receive and send.

Your child will receive an email notice that this account was added to another device, which is a good opportunity to let them know that you can see anything they send or receive from their phone. You can also select which devices get forwarded any conversations taking place on the device in these settings (Figure 8.4).

You might be wondering what prevents them from going in and disabling this feature. If you have a child who seems to be especially combative on this front, you can actually disable the ability to alter accounts (in the restrictions menu). This means that they will need the restrictions passcode in order to make changes to their email, text message, or social media accounts.

Figure 8.4 Setting up text message forwarding.

Why this is helpful? Any iMessage your child receives means you'll also receive and see the entire conversation. If for some reason your child deletes the conversation from their phone, you will still have a copy of it. Also, with the ability to make account changes disabled, your child won't be able to add or switch accounts (especially if you think he/she has another Apple ID).

For the full set of instructions on how to do this, visit this post: mrhook.it/imessage.

Other Options for Viewing Text Messages (Dependent on Carrier)

At this point I'll mention again that actually asking for your child's phone to look at their text messages on occasion can be the greatest deterrent to inappropriate conversations. However, if you feel, based on your child's behavior, that there is still something potentially happening via text messages or social media, there are more options for you through your cell phone provider.
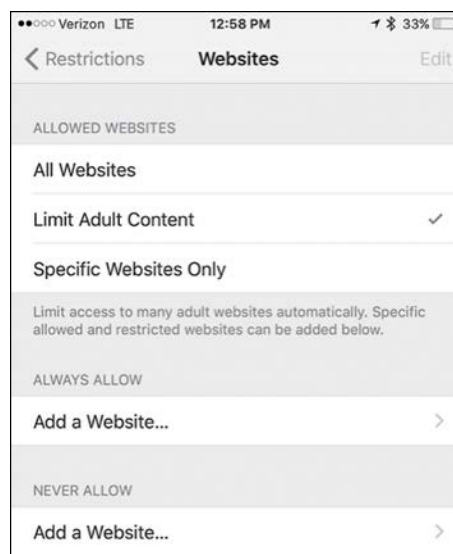
For example, Sprint has the option to limit who your child can send to, and also who they receive from. Going to the sprint.com website and going into your "my preferences" section gives you the ability to set limits and permissions and check the option for text(s). This allows you to select the device you want to control and then provides a number of options to:

- Not block text messages (basically the option to unblock, if you've blocked earlier)

- Block all text, inbound and outbound

- Block all inbound text

- lock all outbound text

- BLOCK ONLY "these" numbers for inbound/outbound

- ALLOW ONLY "these" numbers for inbound/outbound text

Why is this helpful? With the last option, you could set up your child's phone so that it only receives texts from preapproved people. This is especially helpful if your child is involved in a situation of harassment or bullying. It can also be a handy option to have on hand should your or their cell phone number ever be used as spam for advertisers. You can block those messages and senders in this section of your permissions.

Although this example is Sprint specific, other major cell phone providers (T-Mobile, Verizon) offer similar plans or features that let you dictate who can send and receive calls and texts on a particular device. Contact your cell service provider for more information.

Helping Focus with Guided Access

Some restrictions help with apps or websites, but there are also times when your child may need some help with focus. Any type of mobile device comes with its share of distractions. Phones and tablets have pop-up notifications, and this has now stretched to laptops and desktops as well. On a device that

allows multiple windows, you now have multiple sites and programs vying for your attention.

In the iOS world, you now have the option to "multitask" between two apps, but generally the number of programs that can distract you is limited. However, kids will still feel the need to switch between apps on occasion and could potentially get sucked into social media or binge-watching Minecraft videos on YouTube. Enter guided access and the ability to lock in apps.

Located under the general settings and buried in the next level of accessibility settings is where you can locate guided access (Figure 8.5). Turning on guided access requires yet another passcode (different from the passcode lock and the restriction lock). Once

Figure 8.5 Guided access

enabled, with a triple-click of the home button, you can enable single-app mode, which force-locks the device into an app until you enter the passcode to release it.

The updated version actually lets you lock into the app for a predetermined time period as well, so you can set the lock for 30 minutes so that your child focuses on a particular website or app for that chunk of time.

A quick story here to proclaim the success of this particular restriction with a family in our community. I had shared the guided access feature during a parent night, and the very next day I received a phone call. One particular mother had been struggling with her son's ability to focus on an app (in this case an ebook that he had to study). The night after our talk, she went home to
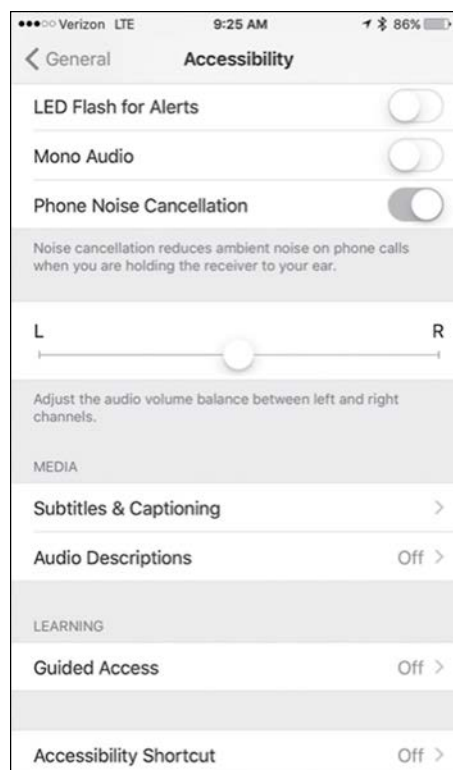
test out this feature. Her son was reading his ebook as usual, and as usual, he would switch to Facebook after about 2 minutes of reading.

When he stepped away, she took his iPad and enabled guided access mode. When her son returned to finish his work, she left his room and headed downstairs. Before her foot hit the first step she heard a loud *"Mom!"* and knew she had succeeded (as he had tried and failed to exit the app).

Internet Filtering

As was mentioned earlier, filtering the internet is only successful when devices are connected to it. With smartphones, internet access is only a mildly strong cell signal away. That said, it's advisable to have some level of filtering on your home devices as well as any school-issued ones. Enter my disclaimer here once again: A strong internet filter is no substitute for strong parenting.

OpenDNS

OpenDNS (opendns.com) is a free online filter with some upgrades available for a price. While it's geared mainly to protect against virus and phishing attacks, there are now ways you can set up parental controls. One of the great things about OpenDNS is that you can set up web filtering at the router level and differentiate based on devices. So that means that your kids' devices can have different filter settings than your own devices.

Circle Home and Go

This is Disney's entry into the fray of internet filtering. It provides a plug 'n' play device for $99 that connects to your home network. Then using an accompanying Circle Home app, you can set limits on internet connectivity and screen time for all Wi-Fi–enabled devices. Using the Circle Go app extends that filtering and oversight to mobile devices not at the home (for a cost of $9.99/month). Learn more at meetcircle.com.

Tracking and Spying Programs

In addition to filters that extend out of the home like Circle Go, there is a growing trend in services that allow you to track and monitor your kids' accounts and devices. These tracking programs walk a fine line between giving your kids some of their own space to learn and grow and spying on their every move. Key logger programs do much of the same things on computers where you can see transcripts of every keystroke made on a laptop or desktop. This could be useful to prompt a conversation, but you also run a risk as a parent of losing trust and communication with your child.

The filter market is flooded with many different options, and some now extend to mobile devices. As these change so frequently, I won't spend a lot of time going over them, but what follows are a few that I've discovered or that families have used in the past that seem to do a fair job of protecting kids from inappropriate content.

Of the multitude of tracking programs out there, TeenSafe (www.teensafe. com) seems to be the most popular, with already over a half a million users as of summer of 2016. TeenSafe allows parents to monitor kids' social media accounts, their text messages, and who they are on the phone with, and also track their location. All of this comes at a cost of $14.95 per month and the additional risk that your child may feel there is a lack of trust between you.

Other Paid Services

Net Nanny, McAfee, and K9 web protection each offer different feature sets at a yearly or monthly price. Net Nanny (netnanny.com) seems to be the favorite of communities and ratings systems, as it's specifically geared toward parental controls and filtering on children's devices. Combining the services of Net Nanny or OpenDNS with the built-in website restrictions of iOS, and you'd have a pretty powerful combination protecting your kids.

The Ultimate Safety Device: A "Dumb Phone"

When filters, restrictions, and monitoring don't seem to be helping your situation, you could go the extreme route and give your kids a "dumb phone." In talking with parents, many claim the need to be able to connect with their kids either via a phone call or text message. Since smartphones come with these features but also a host of other avenues of communication, giving your child a phone with only calling and texting features might be the answer.

However, with the continually increasing smartphone market coupled with the decrease in cost of those devices, this option may soon be gone. Which leaves only the ultimate option for keeping your kid safe: not giving them a device at all. Just know that every action has a consequence, and ultimately, it's best to work with your kids on tackling these modern digital problems head-on and as a team. By choosing to shut out the digital world, you kick the can down the road to when your child leaves your home and now has access to this forbidden world—with no knowledge base or wisdom on how to navigate it.

DIVE
INTO UDL

*Immersive Practices
to Develop Expert Learners*

**Kendra Grant
+ Luis Perez**

Your Assumptions and Beliefs

The classroom is an extremely busy place with dozens of moving parts, dozens of personalities, and hundreds of demands on our time in any given day. There are just too many pieces of information for us to process or even notice them all. In many ways, the classroom is an example of the *selective attention principle* (Simons, 2010) at work. The effects of selected attention are illustrated in Daniel Simons and Christopher Chabris's famous "Gorilla" video (**bit.ly/DiveIntoUDLCh4a**): When instructed to count the number of times the players in white pass a basketball during the video, viewers become so focused on the passes that they fail to see a person in a gorilla suit walk through the game.

Our focus becomes a filter.

For many of us, our assumptions and beliefs about learning and learners become our focus and our filter. We expect to see certain behaviors: for certain students to succeed, for other students to struggle. We count the passes, but counting the passes reinforces our expectations so we fail to see the gorilla walk across the floor.

It's only when we consciously look for the gorilla—when someone points out that we *should* look for the gorilla—that we see it. If you are lucky enough to have experienced the Simons and Chabris video without prior knowledge of its intent, it is an eye-opening moment. You can't believe you missed the gorilla. It's so obvious! However, some will insist the video was doctored. There is no way they missed that gorilla! The gorilla wasn't there. If you want to give the test another try, take a look at "The Monkey Business Illusion" (**bit.ly/DiveIntoUDLCh4c**) or "Movie Perception Test" (**bit.ly/DiveIntoUDLCh4b**), which illustrate the same concept.

What's the "gorilla moment" in your professional life? It's when what you *expect* to see and pay attention to causes you to miss or misinterpret something important. It might be observing your class engaged in a task and missing the student quietly struggling. It might be watching a student not know what to do next and assuming they weren't listening to your instructions. It could be assigning leveled text based on learners' decoding skills, rather than their excellent comprehension skills when using a screen reader.

For Kendra, the gorilla moment was assuming disability was internal to the student and not dependent on a variety of factors within her control to change. She saw learners struggling with reading and writing tasks and provided technology to accommodate the disability. Although this recognized the underlying ability of the learners, she didn't challenge (until later) the system belief that students who didn't fit the "norm" required a diagnosis and label to get extra support and remediation, or the conventional belief that text-based instruction and assessment were the best ways to teach and for students to learn.

> *Tweet:* What we measure and count is our focus. Our focus then becomes our filter, reinforcing what we "know" about our students. With this laser focus we often miss the gorilla in the room. What's your gorilla? **bit.ly/DiveIntoUDLCh4a** #DiveIntoUDL

Examining your assumptions and beliefs on a regular basis can help you clear your filter. Taking a step back from your teaching to look for the gorilla in your instruction and assessment, the learning environment, or your expectations of students, however, can cause disequilibrium. It can be shocking to suddenly see the gorilla. This is why it is helpful to share and reflect with others. Do they see the gorilla too?

Exploring your assumptions and beliefs about teaching, learning, and learners before you begin exploring more about UDL will give you a benchmark to help you see your professional growth over time. Remember, there are no right or wrong answers to the "Pause and Reflect" questions. This information is for you and your professional growth, so consider recording it in some way to reference later.

❚❚ *Pause and Reflect*

Do you see the gorilla?

- How has your understanding of the average student influenced your teaching practice?
- How has your role as a general education or special education teacher shaped your teaching practice?
- Is it possible to reach and teach every student given the vast diversity of learners in our classroom?
- What does it mean to have a disability? Who should support students with disabilities or other learning differences?
- What role does technology play in your life? What role does technology play in your classroom?
- Who currently succeeds in your classroom and why? Did you succeed in the education system? Why or why not?
- What is your role as a teacher? What is the role of a student? What is the goal of learning?

Exploring Your Assumptions and Beliefs

Your assumptions and beliefs are like the clothes in your closet. Some fit perfectly. Some don't fit anymore, but still you hang on to them in case they fit again (they usually don't). Some are old, worn-out favorites that *may* be worth keeping. Can they be updated and repaired, or should they be replaced with something more up-to-date? Some might be trendy. Even if these seem to fit, do they stand up to everyday wear? Will they be replaced when the next trend comes along, or does this trend have its roots in solid design?

Just like performing a seasonal closet clear-out, regularly bring your assumptions and beliefs about learners and learning out into the light and examine them closely (Figure 4.1). Try them on. Be critical. Consider getting a new perspective from your trusted peers during this process, especially those with a critical eye and unflinching honesty!

**Assumptions & Beliefs
Routine #ClosetClean**

Keep   Repair   Toss

Tweet: Regularly "clean" your instructional closet. Review your assumptions and beliefs about learners and learning. Keep what fits, then tailor or dispose of those that no longer do. #DiveIntoUDL

Figure 4.1 Assumptions and beliefs: Clean out your instructional closet regularly.

Every teacher comes to teaching with assumptions and beliefs that come from a variety of places and times: our school experiences, our children's (or friend's children's) school experiences, our pre-service, our graduate degrees, the PLN we curate, and the climate and culture of the schools and districts we work in. Some of these assumptions and beliefs may be accurate. Some may be accurate but difficult to implement for a variety of reasons. Others may need updating, refining, or changing. For example, when Luis first started learning about UDL, his focus was primarily on removing barriers by ensuring educational materials were accessible. This focus was shaped by his experience as a legally blind student who experienced frustration in trying to access the information he needed to complete his graduate education. Similarly, when UDL originated at the Center for Applied Special Technology (CAST), the focus was on removing barriers that kept "learners in the margins" (like Luis) from accessing learning. As UDL evolved, this focus expanded to more effectively address the needs of all learners, not just those with identified disabilities.

Kendra came to teaching with the assumption that disabilities were internal to the student, based on a medical model of identifying and labeling students who didn't fit the system. She most likely internalized this message from her schooling as well, because there was little talk about the system not fitting the students. Assistive technology, such as text to speech and speech to text, appeared to be the perfect retrofit for these students. Kendra's "how did I miss that?" moment came while creating a UDL video with Mindy Johnson, a UDL specialist at CAST. In the video, Mindy explained that learner ability (or disability) is at the

intersection where the individual and the environment or context met. Kendra suddenly saw what she'd missed: It isn't enough to just provide "disabled" students with technology to "level the playing field." Equally important is changing our instructional practice to better support the variability of our learners. Rather than berate herself for focusing on one aspect of UDL, accessibility, Kendra recognized her understanding and application of UDL had grown and would continue to grow over time.

Figure 4.2 Our current focus on time (number of hours per day, number of periods in a course, number of months in a grade) makes assumptions about learning. Ask yourself: Is time-based learning best for *all* learners?

Rather than take an all or nothing approach, give yourself permission to "start where you are," connect and scaffold to what you already know and do, and then move forward in a purposeful way. The challenge for us as educators is to remain open to examining our beliefs about learners and learning on a regular basis. We must question what we "know" and actively seek evidence that can confirm or refute our assumptions and beliefs (Figure 4.2). By sharing and discussing our assumptions and beliefs with others, we bring them out into the light to examine critically with the defining question: Is this best for *all* our learners?

The next sections explore assumptions and beliefs: Where they come from, how the current system can go against them, and how, when you're ready, you can support others in examining their own. This is your first opportunity to choose your level. Consider your UDL Assessment score from Chapter 3, as well as your experience examining your assumptions and beliefs to help you start where you are:

- **Wade In: The Game of School** (page 30). In this section, you'll consider if you played the *game of school* and how your school experience influences your current assumptions and beliefs.

- **Shallow Swim: System Assumptions and Beliefs** (page 33). In this section, you'll examine how assumptions and beliefs embedded within education impact learners and limit change.

You'll also explore, in detail, the system's assumptions and beliefs about assessment and their far-reaching effects on learning and learners.

- **Deep Dive: Leading the Change** (page 37). In this section, you'll explore how to leverage the ISTE Standards for Educators (2017) to frame the changing role of the educator, as well as discussion points with which to support others as they examine and update their assumptions and beliefs.

Wade In: The Game of School

When first examining your assumptions and beliefs, it is important to reflect on your experience of school. What was it like for you? Were you able to successfully navigate the rules and requirements, or did you struggle? Chances are we all had some bumps in the road, but generally speaking most teachers quickly learned to play the *game of school* when they were students. As education innovator and author A. J. Juliani noted in his blog post "The Game of School vs. The Game of Life," even young students can be adept at playing the game. At age 7 his daughter already knew the rules: "Make the adults at school happy, and the adults at home will be happy" (Juliani, 2017). Students who figure out the rules of the game are usually the most successful in the current system. They are compliant; they listen quietly, put their hands up, stay in their seats, do what they are told, and complete (mainly written) tasks on time and as assigned. Ultimately, in many schools, these are the students who we plan for and teach to.

Whether we realize it or not, many of us may have pursued a career in teaching because we learned to play the game well. We navigated the requirements and avoided most labels. We could completely fulfill the

> *Tweet:* "Good" students play the game of school. They are compliant. They do what they are told. They complete (mainly written) tasks on time and as assigned. Ultimately, in many schools, these are the students who we plan for and teach to. #DiveIntoUDL @ajjuliani

> ***Tweet:*** UDL shifts the focus to mastering learning, not the game of school. #DiveIntoUDL

reading, writing, and test-taking requirements. We knew the rules and were able to play effectively enough to complete the game and get our degrees. In other words, we represent the subset of students that are successful in the current system.

Kendra's Game of School

Kendra played the game of school—eventually. As she explained:

> "In elementary school I liked to move a lot, and I was very opinionated. Girls in particular were supposed to be quiet and stay in their seats and do their work. I didn't fit this description. I loved to read and write, and I had a good memory. So even though I didn't fit the mold, I was successful. Eventually, I learned to behave like I was supposed to. I developed visual strategies to organize and plan. I learned to keep my opinions to myself—for the most part. My experience, while not devastating, suppressed my authentic self. Although I learned, I'm not sure I learned deeply. Today I might be labeled with ADHD or difficulties with executive functions. (Is it any wonder I worked in special education?)

> "Because I learned differently, I have always sought ways to level the playing field through the application of UDL and technology to my teaching practice. My goal is to help every learner recognize and celebrate their strengths rather than feel less for not fitting the norm."

Luis's Game of School

In fifth grade, Luis's teacher gave an assignment that required the class to memorize the capitals of all the Latin American countries, the kind of rote memorization that defined much of education at that time in the

Dominican Republic. The teacher made a deal: Anyone who could recite all of the countries and their capitals would be allowed to leave a little early. Luis made a plan:

> "I knew I had a good memory, so I volunteered to go first. Sure enough, I got them all right. I went home early!

> "From that point on, I knew that my memory was an asset I could rely on to overcome one of my weaknesses: a tendency to procrastinate and wait until the last minute to prepare for tests. Through high school, I was able to memorize the layout of my textbooks (a form of photographic memory) and easily recall information during tests based on its location on the page. This served me well until college. I attended a small liberal arts school where assignments required more critical thinking. As a result, it took me a while to adjust to the new demands of college. What had helped me succeed earlier in life had also kept me from developing the other skills I needed to be successful in higher education."

⏸ *Pause and Reflect*

Take a moment to consider the *game of school:*

- Did you play the game of school? Did you know you were playing?
- What might have happened if you had struggled with one or two of the "rules?"
- Is there a connection between how you played the game of school, and your assumptions and beliefs about learners and learning?
- Do you see the influence of the game of school in your school or classroom?
- Are there parts of the game you don't think will change? Why?

The Game Changer

Our learners may be able to play the game of school up to a certain point, but as they progress through school and the demands increase, this becomes more challenging.

UDL changes the rules of the game. It recognizes that for some learners the game of school is difficult, if not impossible, to play. Rather than one pathway around the board and strict rules, UDL encourages multiple pathways and includes flexible rules to broaden, rather than narrow, who can play. With this in mind, go to the "Next Steps" section (page 42) to apply what you learned, or continue reading if you are ready to go deeper into how the system reinforces our assumptions and beliefs.

Shallow Swim: System Assumptions and Beliefs

Many of us naturally and regularly examine our assumptions and beliefs. We seek to not only confirm and validate what we see and do in our classroom, but also actively seek out research and opinions that challenge our norms. Although this is important to do as a professional, we still have to navigate within the current system.

Beyond the individual assumptions and beliefs you each bring with you from your own experiences in schools are the many assumptions and beliefs about learners and learning that are embedded in the education system—subjects, rows, marks and grades, and testing. Some assumptions and beliefs are so embedded we fail to see them, let alone examine them. There are multiple gorillas in the room.

These long-held, system-level beliefs can make it more difficult when you want to revise or replace some of your own assumptions. When you do challenge them, you often can only go so far before the system blocks additional change. You may encounter vocal opponents who are happy with the status quo. For example, educators who have taught in a particular way for years may have no intention of changing their practice. Parents who are used to the system could be resistant to change, concerned about their children's ability to get into their colleges of choice. Students

who excel in the current system might object. Even the administration, fearful of pushback from staff, parents, students, or their own superiors, might be hesitant to tackle big issues. In addition, the requirements of the system—standards, curriculum coverage, grades, report cards, college requirements, grants, funding, and so on—make it difficult to veer very far off the current course.

Assumptions and beliefs, beyond being deeply ingrained, are also complex and interconnected. Sometimes they are simply the result of TTWWADI: That's the way we've always done it. For instance, years ago at an educational technology conference, Kendra heard the story of a small school with two entrances, only one of which was ever used. One teacher began to question why and eventually discovered that, many years before, the school started using the one set of doors while the second set was being repaired. The repairs took from the end of one school year, over summer break, and into the next year, so using the single set of doors became the norm over time. It was just the way things were done, and no one had previously stopped to consider why.

Now, you may say, doors are one thing, but ideas, such as assessment and tests, are another. We don't rely on one type of assessment because of TTWWADI—do we?

Testing 1, 2, 3

Let's put tests to the TTWWADI test by considering the assumptions and beliefs surrounding current testing practices. Rather than standardized tests, which we currently have little authority to reduce or change, think about teacher-designed tests and quizzes. Administered at the end of the week or a unit of study, these tests are generally paper-and-pencil tasks created to evaluate students' content and procedural knowledge. They include all the math, spelling, history, science, and reading tests that require a student to read the instructions and then write their answers or circle the correct response. The design and delivery of these types of tests are based on the assumptions and beliefs associated with four areas: ability, motivation, learning, and assessment. The following outlines the underlying assumptions and beliefs often associated with tests:

Ability

- Students are able to read the test and write the answers.
- Students are able to understand the cultural references embedded in the test.
- Students have English language proficiency.
- Students are able to focus and persist in the completion of the test.
- Bell curves are a natural occurrence; some students will do well, others will fail.
- Results without technology support are superior to results with technology support.

Motivation

- Students will pass the test if they study.
- A low score on a test will motivate students to try harder.
- Tests and the accompanying grade motivate students; they wouldn't bother to learn if we didn't test them.

Learning

- Tests are a good way for students to demonstrate their learning.
- Learning is measured by how well students remember facts, information, algorithms, and so on, and this measurement of understanding is best captured by a test.
- Tests (and the accompanying grade or percentage) provide students with feedback about their learning.
- Tests accurately reflect student's understanding of the material or concepts.

Assessment—Validity/Reliability

- Tests are the most valid and reliable means of measuring student learning.
- Summative assessment supports student learning.
- Grades and percentages are reliable and objective; teacher observation and comments are subjective.
- Tests are important to determine students' marks on their report cards.

❚❚ ***Pause and Reflect***

Take a moment to quickly respond *yes* or *no* to each of the statements in the list of test assumptions and beliefs. Then:

- Choose one assumption you agree with, then ask yourself: Why do you agree?
- Where did the assumption come from, and how is it confirmed for you?
- Is there any evidence that counters your assumption?
- Repeat these steps with an assumption you disagree with.
- Consider revisiting your assumptions after you explore Chapter 5.

- Tests are the simplest, quickest way to assess students given the size of classes and the demands on teacher time.

What Are We Assessing?

Usually, when a test is created, little attention is given to the reading and writing requirements and their impact on the final outcome. If students fail a history, math, or science test, the reasoning is they didn't study, know the material, or care. The common belief is that students who score poorly on the test need to put in more effort, to try harder.

One reason for these beliefs is that written tests are based on the assumption that everyone should be able to read the text. If a student can't, that student, rather than the test, has a deficit or disability. To access technology or other accommodations to support completion of the test, students often require a label identifying the disability and a legal document in the form of an individual education plan or program (IEP). Even with this in place, students often need to actively seek out and request the extra support or accommodations. This need for a label or special request emphasizes the belief that the accommodation seeker is "different." The assumption is that success requires a certain standard, and the standard

must be met independently (for example, without technology). Dr. Dave Edyburn coined the phrase *naked independence* to label the belief that brain power alone is superior to any "assisted" mental activities (Edyburn, 2006). As such, when students are provided technology accommodations, these tools are available only if they are not viewed as providing an unfair advantage. In many cases, even if technology support is provided during regular class time, students must shut off the support features during a test. The assumption is, students need to show their work on their own without the advantage of technology (Figure 4.3). Imagine if we applied this to another support technology, such as students' prescription glasses?

Figure 4.3 Do you think someone who wears glasses in class is cheating?

Tweet: We don't tell students who wear glasses that they are cheating because they see better with the help of lenses. How is using technology to learn better any different? #DiveIntoUDL

With this in mind, go to the "Next Steps" section (page 42) to apply what you've learned, or you can continue to the next section if you are ready to take a deep dive into leading change and challenging embedded, systemic assumptions and beliefs.

Deep Dive: Leading the Change

It is important to recognize that your individual assumptions and beliefs about teaching and learning are influenced by your personal experiences, as well as by the assumptions and beliefs embedded in the education system. Although you may enthusiastically dive into change, regularly challenging your assumptions and beliefs to transform your classroom, you may find others resist this sort of disequilibrium. Whether you are called upon to champion large-scale change within your school or district, or, whether on a smaller scale, you want to share and grow professionally

with colleagues, you may encounter assumptions and beliefs that are deeply held, slowing down and even halting the change you know your school and learners need.

Assumptions and beliefs are deeply ingrained. They filter how we perceive the world, influence what we see (or don't see), and determine how we will act. As educators, our professional reputations are based on our skills as pedagogical experts, and these skills are on display every day in the classroom. Examining our assumptions and beliefs, admitting their flaws, and committing to change, are very private and, at the same time, very public activities. As such, many educators hold firmly to their beliefs and resist altering what they do, because it is viewed as integral to who they are (Owston, 2004). But unless we actively challenge our assumptions and beliefs, most change is temporary. As Stephanie Hirsh and Joellen Killion wrote, "When practices change without deep exploration of the principles that guide them, people will be pulled back to their old ways" (2007, p. 21).

Struggling to change isn't just an individual problem, but a system one as well. The call for system change, to transform education, is constant. Most agree it is necessary, yet it seems little changes. Like individuals, districts function on assumptions and beliefs. If these are not explored, challenged, and updated, each initiative becomes just another in a long line of initiatives—all enthusiastically rolled out then quietly forgotten. In "The Power of Beliefs and Assumptions" chapter of its *Becoming a Learning System* course book, Learning Forward made this clear, "Many educational change initiatives fail because leaders focus too much on actions and not enough on their underlying assumptions. New behaviors often are not sustained over time because people's beliefs have not been transformed, and the principles and assumptions needed to sustain the effort are not deeply embedded in the individuals and organization" (2014, p. 13).

When you're trying to lead it, this type of change is challenging and messy work. You want to be action-oriented, so you focus on a plan. You outline the steps, assign people to be responsible, create a timeline, and determine metrics to calculate success. All this busyness can ignore the assumptions and beliefs that should underpin, but are in opposition to, the plan. You're placing the action cart before its team of horses: the assumptions and

⏸ *Pause and Reflect*

As Margaret Wheatley wrote, "I've found that I can only change how I act if I stay aware of my beliefs and assumptions. Thoughts always reveal themselves in behavior. As humans, we often contradict ourselves—we say one thing and do another. We state who we are, but then act contrary to that. We say we're open-minded, but then judge someone for their appearance. We say we're a team, but then gossip about a colleague" (2010, p. 22).

To help you stay aware of how your beliefs and assumptions reveal themselves and affect your students, take a moment to complete the chart in Figure 4.4. You can add your own assumptions, as well, to personalize it. Consider using it with other educators formally or informally to begin the messy work of examining assumptions and beliefs. You might also want to create a similar chart for your district.

Assumption/Belief (What I say)	Action (What do I do)	Reality (What others experience)
Treat all students fairly		
Give students ownership of their learning		
Include summative assessment practice		
Create a safe, welcoming classroom		

Figure 4.4 Chart your assumptions, actions, and impact to help begin sustainable change.

beliefs. Transforming individual assumptions and beliefs and embedding them in the system must come first. Being a leader requires you to advocate for change, share the vision for the change, and then model the process for change you want to see. It requires you to be vulnerable, to be willing to talk about difficult topics and have your assumptions and beliefs challenged.

In all this discussion about assumptions and beliefs, one thing is often missing: students. They are integral to the education system, and they too have assumptions and beliefs about themselves, the purpose of schools, and the way things work. They are more perceptive than we think. Even if they don't express it, they often notice when our assumptions and beliefs do not align with our actions in the classroom. For example, we hear such terms as *student agency*, *student ownership of learning*, *voice and choice*, and *student-centered instruction*, yet, when students enter the classroom, all the traditional accoutrements are there: rows, bells, tests, text-based instruction.

It isn't enough to say we want these things for students. We have to examine our assumptions and beliefs about student ownership and leadership. It requires shared ownership and balance.

The Educator as Collaborator and Facilitator

Most of you have probably heard the advice that educators should move from being the "sage on the stage" to being a "guide on the side" (King, 1993, p. 30). The ISTE Standards for Educators ask you to move beyond both these roles, urging you to get into the thick of it and learn with your students. This is clearly defined within the role of Collaborator (ISTE, 2017), which encourages educators "to redefine their relationship with their students as they model collaboration and facilitate authentic co-learning experiences" (Indicator 4b).

Currently, educators are considered pedagogical experts. In many ways, this assumption and belief is true; educators have studied and trained to become skilled at their craft. The traditional view assumes the educator, as the expert, is responsible for determining the goals, methods, materials,

and assessments to be used in the lesson. Educators are also often considered subject specialists as well, especially in the higher grades. Again as experts, they have the jobs of determining what content is important to know and delivering it to their students. With the advent of mobile technology and the means to easily create and share content, however, students are no longer dependent on the teacher for their content—or learning. Outside of the classroom they can pursue any topic that interests them, in virtually any format. These seismic shifts have heightened the need to shift the role of the teacher. Although pedagogical expertise is still important, the hierarchy of the classroom is quickly being replaced with environments where the teacher is a co-learner, modeling learning as a collaborative, connected, and shared experience.

The ISTE Standards for Educators (2017) signal not only a change in what teachers do, but also a shift in control. For many educators, their role is clearly defined, established by decades of tradition. Ownership and control of learning is based on the assumption that teachers lead and students follow. It is the educator's job to create the lesson, then teach it and test how well students understood it. It is the student's job to learn the material, complete assignments, and take the assessments. Even educators who embrace changes to their role often struggle with the release of responsibility for learning to students. They also struggle against system assumptions and beliefs that reinforce the status quo. Report cards, standard parent-teacher conferences, curriculum maps, and standardized tests place decision-making and ownership of learning in the hands of the teacher.

The Educator Standards also highlight significant shifts in ownership through the role of Facilitator (ISTE, 2017), in which educators are encouraged to "foster a culture where students take ownership of their learning goals and outcomes in both independent and group settings" (Indicator 6a). To "foster a culture of ownership" the educator is encouraged to profoundly change the student-teacher dynamic by guiding students to assume an active role in the why and how of their learning. In essence, students are to shape and maintain the learning and social culture of the classroom, but they may not always be ready to take on this role as co-designers of

learning right away. You can help your students develop classroom leadership skills by showing that you trust them and their abilities to grow into a shared role. You can do this by:

- Providing students with opportunities to set and pursue personal goals that extend beyond a single lesson or unit to the entire school year. These goals may be related to personal qualities, specific skills, or passions students want to pursue. To benefit the rest of the class, students would be asked to provide regular status reports during which they share what they are learning and ask for support from peers who have a similar interest.

- Actively involving students in the development of classroom norms that are revisited and revised as classroom events warrant throughout the year.

These steps show students that you follow through on your stated beliefs when it comes to their ownership of learning. You don't just pay lip service to them, but actually put your evolving assumptions about learning into practice as you redefine classroom roles. Shifting the responsibility for learning to your students will help them develop their self-regulation, metacognition, and self-efficacy, some of the qualities that define an expert learner under UDL.

Next Steps

Our assumptions and beliefs are complex. They are a combination of what we've learned, and what we've experienced. They can, just like our clothes, be outdated, worn, and difficult to throw away. Our assumptions and beliefs about learners and learning, however, ultimately determine what our classrooms look and sound like. Too often, if we don't critically examine our assumptions and beliefs, what we *say* we believe and what we *do* in the classroom are in direct opposition. Although it can be uncomfortable to critically examine our long-held assumptions, it is crucial to continually revise and update them. We must also be open to having our assumptions and beliefs challenged, not just by colleagues with whom we

⏸ *Pause and Reflect*

If you lead an upcoming workshop or presentation to staff/faculty, consider how you can model the shift to co-learning. You may decide to ask participants to set the goals and agenda for the session; include virtual participants/guests; and provide options for what people learn and a variety of resources and materials to model accessibility.

Brainstorm (perhaps in a Google Doc) all the objections that might come up when discussing profound changes to roles, learning, and classroom culture. Then list proactive ways to acknowledge, overcome, or go around the problems. You might also include links to videos or blogs that dive deeper into the question. This document will help you refine your thinking, and act as a resource as you work with other educators. Consider sharing this document so others can add their own thoughts or links, or create a new document with a team of educators as an ongoing exploration of the changes that are required to keep moving forward. Together you could also create a "Now/Future" T-chart to compare and contrast the traditional classroom culture to one in which ownership and learning is shared. Consider adding a rating scale (1 - Now, 5 - Future) to assess where you are as a staff/school, and then consider ways to move toward the future. As you work through the process, make sure to reference the Facilitator role in the ISTE Standards for Educators.

agree, but also by those who may see things differently. Like individuals, systems also hold assumptions and beliefs. Although we often recognize policies, procedures, and programs are outdated and in need of change, we fail to recognize that the underlying assumptions and beliefs, firmly embedded and interconnected in the daily routines of the system, are also in need of repair and replacement.

The ISTE Standards for Educators (2017) can help frame and guide discussions about assumptions and beliefs at both the individual and system level. As a leader, you need the courage and conviction to be willing to relinquish some control as you transfer some of the responsibility for

learning to students. As a Collaborator and Facilitator for learning *with* your students, you will show them that they have your trust as partners in the nurturing of a classroom culture built around shared values and norms. This transfer of control and responsibility for learning may be one of the most difficult shifts for educators to make, but it may also be the one that results in the most significant transformation of learning from something that happens to students to something they can do for themselves as expert learners.

> **Tweet:** Our assumptions and beliefs about learners and learning ultimately determine what our classrooms look and sound like. If we don't critically examine our assumptions and beliefs, what we say we believe and what we do in the classroom are in direct opposition. #DiveIntoUDL
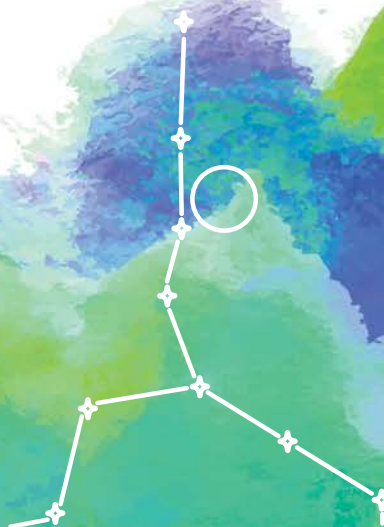
Website Activities

To delve even deeper into this subject, scan the QR code to access additional information, videos, and other digital resources related to this chapter on the companion website.

Stretch Yourself

Yourself

A Personalized Journey to Deepen Your Teaching Practice

CAITLIN McLEMORE
AND FANNY PASSEPORT

Chapter 7

Self-Reflection

"When teachers stop learning, so do students."

—Jim Knight, *Unmistakable Impact: A Partnership Approach for Dramatically Improving Instruction*

Self-reflection gives us insight into our thoughts and aspirations. The more thorough the process of self-reflection, the better we recognize our thoughts, feelings, values, and beliefs for what they really are. Self-reflection even prompts some individuals to question and restructure their entire belief system! What's more, the meditative process encourages you to re-evaluate your principles and core values in a nonjudgmental manner. Meditative reflection also helps us recall our short- and long-term goals.

We must welcome self-reflection as an opportunity for change—a chance to develop ourselves and our practice and to learn new things. This chapter begins by talking about being ready for change and about self-reflection. But the most productive self-reflection includes compassion and gratitude, so remember to be kind to yourself as you reflect.

Are You Ready to Change?

How do you know if you are ready for change? Answering this question alone begins with self-reflection. Being able to look inside and reflect on

oneself allows for a better sense of what needs to change. You must first know where you are coming from before you decide where you need to go.

In his book *Theory U: Leading from the Future as It Emerges,* Otto Scharmer (2009) theorizes that we are not one but *two* selves. One of our selves is the result of our past experiences and the other is our future possibility. He shares a theory of self-actualization and transformation whereby individuals go through a process of letting go of everything that isn't essential and developing an "open mind" through embracing curiosity, an "open heart" through feeling compassion, and an "open will" through showing courage (Scharmer, 2018, p. 30). Likewise, as we come closer to our destination in this learning journey, it's important to be present with both of our selves. According to Scharmer (2009, p. 42–43), we can reinvent ourselves and innovate by letting go of our past *self* (with a lowercase "s") and welcoming our future *Self* (with a capital S), inviting growth at the deepest level until that Self becomes our reality.

Humans are creatures of habit, so we tend to see everything through the lens of our past experiences. This mindset is a bit narrow, stemming from conditions and strategies that already occurred and not allowing much scope for innovation. When we repeat what we know or force a single solution because it worked in the past (without reconsidering the current landscape and scope of creative options), we are stuck in the *self.* Alternately, when we self-reflect and continuously reinvent ourselves for the purpose of improving our practice, we break free from the known and broaden our perspectives, thinking positively about the future (even when we initially think that our ideas are impossible to implement). As we open up and welcome our *Self,* we see things differently; we act as design thinkers and confront obstacles, creating new ways of seeing how we can do things differently to meet our objective.

Meditation Prompt

Being Open

As you consider Scharmer's Theory U, how could you best practice having an open mind, open heart, and open will when teaching and learning?

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Throughout our life, we keep changing our identity; it's not a fixed thing. Real change happens at the level of our personal identity. Change is a choice—it is intentional (Bodell, 2012). The important learning here is that it is entirely possible to modify ourselves to be more aligned with who we want to be (Costa & Garmston, 2016) and with our emerging self. Everyone has the potential to extend their capacity and become more flexible.

We are ready to change when we can look forward with ambition and hope and leave behind cynicism and judgment. We are ready to change when we listen in order to understand rather than listening to respond. We are ready to change when we seek cognitive conflict (new information that challenges our beliefs), embrace divergent thinking (seeking as many solutions as possible), and push the limits of our thinking to open up horizons instead of building walls to protect our ideas.

Forms of Self-Reflection

There are many different forms of self-reflection. You might adopt a formal self-reflection cycle (through your appraisal cycles, at the end of every teaching unit you complete, by using tools and strategies such as thinking routines every week, and so on); or you might be more casual in your process by striving to reflect when you feel a need or by doing self-reflecting so often that you develop an automatic mindset that becomes part of everything you do.

In yoga, you must be open to the challenge of each individual pose and also be willing to let go of your expectations of what you might accomplish or do. The same is true for self-reflection. We need to acknowledge our limitations and feelings, but also, in recognizing that vulnerability, cultivate the will to learn. Reflection is metacognitive; it's an inner process of thinking about our thinking! As we question and observe ourselves thinking, we make mental realizations about things we like or don't like about our teaching and learning and can then decide ways to modify ourselves to be a better version of ourselves. For example, at the end of a unit, when we self-reflect and realize that there were things that didn't go well, instead of ignoring these things and moving on, we can explore this vulnerability and understand the causes

of the problem. We can unpack and analyze these factors, re-examining what is important to us and how we can adopt new strategies to improve in the future, when similar situations arise.

To develop the habit of self-reflection, we must remove our ego and think honestly about where we are and where we want to be. We must be flexible in our thinking by looking at the details as well as the big picture and by looking at ourselves from both of these perspectives. We must let go of our worries about external gratification—how we compare to others—and embrace openness. Don't be critical of yourself or your thoughts in the moment. Don't concern yourself with what others are doing or what they might be thinking. Acknowledge your limitations and feelings, and embrace your vulnerabilities. Self-reflection offers an opportunity to develop oneself and become increasingly autonomous as individuals.

The down side: self-reflection is not a one-time occurrence, and that can make it challenging. Just like yoga, it is a continual experience that must be practiced on a regular basis to be meaningful and effective. There is a reason we call it yoga "practice"—because you are always practicing. There is no "winning" or graduating in yoga, as there is always something more that you can do. But the more you self-reflect, the better you get in your practice.

Remember that you cannot do everything right away. You cannot go from nonstretching to bendy in one day. There are limitations and things will get in the way. But that is okay; it is all part of the journey, all part of the learning process. Rest assured that as you exercise, you will become increasingly flexible.

The following Take a Breath exercise provides tips for ways to practice self-reflection, and the edtech props suggest easy ways to self-reflect regularly.

Take a Breath

Quick Tips for How to Self-Reflect

Here are four ideas for easy self-reflection:

1. Keep a journal. Choose the format that works best for you (hand-written, typed, recorded, etc.) and journal on a regular basis. Reflective questions for journaling might include:

- ✦ How did my lesson go today? What went well and what might I consider improving upon?

- ✦ How did students react to the lesson?

- ✦ Did students seem engaged and motivated to learn during the lesson?

- ✦ Were the learning objectives met? What learning occurred?

- ✦ What evidence of learning did I observe or record? How might I use that data to prepare my next lesson?

At the end of a teaching unit, week, or quarter, go back and reread your journal entries. Spend some time reflecting on your past self, then write a self-reflection journal entry about this process.

2. Conduct peer observation. You can learn a lot by watching other educators. Even though time is a limited commodity in schools, try to get out of your classroom occasionally to conduct peer observations. And when you are observing your peers, think about what lessons you might take from their teaching. Don't try to copy your peers; rather, find ways to adapt their strengths or positive attributes to your teaching style and classroom.

3. Record your lessons. Make a video of yourself teaching, then watch the video and take notes. Reflect on how the lesson went. (You may have a specific aspect you'd like to target, or you could simply let ideas emerge as you watch.)

4. Schedule time for self-reflection. In your lesson plans or schedule for the workweek, include time for self-reflection and commit to maintaining this practice.

Edtech Props

Creative Writing

Creative writing is a wonderful reflective practice that we all can benefit from. And there is no need to put yourself into a "talented writer" box to do so; writing can be as simple as keeping a gratitude journal, adding one sentence about something you are grateful for each day. This is a great way to reflect on your day from a positive angle. You might be surprised that something that seemed to go wrong in your day actually transformed into an opportunity for growth. This practice also helps us to make decisions and take actions that foster our development. For instance, when journaling becomes a conscious habit, we automatically remind ourselves about who we are and who we are aspiring to become, reflecting on those actions that will bring us closer to our goal.

If you are not so keen on journaling, perhaps you can take five minutes every day to write down what you achieved that day—something we often overlook. We maintain a to-do list, crossing out things as we go but adding just as many—the list never goes away (the nature of life)! Always thinking of what *needs to be* done, we spend very little time acknowledging all the things that *have been* done, and that should change. You deserve to celebrate your achievements!

Reflecting with Colleagues and Others

It is important to develop connections with other educators at multiple levels. Developing meaningful relationships with colleagues not only helps you stay connected but can help you grow as an educator. If you have a personal connection with a colleague, then it may be easier to work together on areas of growth. Find a supportive colleague or group of colleagues to collaborate with on your learning journey, as their insights can be a valuable part of your reflection. Also, there may be times when you are asked to help students or colleagues with their reflections, either informally or in a coaching situation, and we encourage you to do this. Collaboration builds something even greater than we can accomplish on our own.

As educators, we spend a lot of time giving and receiving information every day. However, our connections with others are more impactful when we listen and inquire. Coaching can be defined as this quest or journey of listening and inquiring to guide the coachee toward revealing his or her internal capital.

Educator Erin Lawson (district technology coach at Orchard Farm School District in Saint Charles, Missouri) shares her experience on developing the *sine qua non* condition for coaching to be successful:

> As a district technology coach, "technology" and "coach" seem to separate often. My role as a coach requires building and keeping trusting relationships with the educators in my district. Once a relationship is built, and I know the strengths and stretches of a person, the process of gently pushing that person to be the best educator begins. Technology integration happens naturally within that growth process.

When coaching, we thrive to support the coachee to think deeply and make new connections. For coaching to be effective, the coach has to suspend his or her judgments and actively engage in colearning and codeveloping. It all starts by listening, but this is a complex skill that is often taken for granted. Scharmer (2018) talks about "generative listening" as the highest level of listening. When we use this type of listening, we are intentional; we aren't passive or simply reconfirming what we already know. Instead, we listen with the intention to innovate. Generative listening is a very active listening style that allows space for the unknown and the new to emerge. It is a practice in mutual understanding and respect. Here are some tips for being an effective generative listener:

✦ Let go of "just being a teacher" and embrace your singularities. When you listen to someone, do not listen from a formal distance but insert a bit of your personal self into it. Do you listen to your colleagues or students the way you listen to your parents or your own children? Give all your attention to the other person.

✦ To truly open up to the other person, adopt an open nonverbal-communication style. Avoid crossing your arms and legs, and sit forward in your chair. Physically demonstrate that you are "receiving" what the person is saying rather than waiting for your turn to add something. Adopt a positive expression, nod, and capture the gestures of the other person to connect and develop the rapport that is necessary to have a harmonious conversation.

✦ Remember that it's not about *you*. Remove the "noises" of your ego in your head (judgments and autobiographical dialogue) to listen as openly as possible.

✦ See yourself as an instrument that pulls the message of the other person into reality. You can do this by echoing words or big concepts, or by paraphrasing.

When we converse with others, it's important that they feel listened to and understood. In order for them to feel listened to, we can paraphrase them. Costa and Garmston (2016) explain three different types of paraphrasing to achieve three different outcomes: (1) to acknowledge feelings and emotions, (2) to organize ideas and content, and (3) to highlight the main content to the abstraction level. Think about how it makes you feel when someone mirrors back your thinking, making your ideas and feelings visible. Paraphrasing is an incredible listening strategy that teaches us a lot about about another person in a present and respectful manner.

Coaching questions can also be very handy for exploring and identifying someone else's thinking. According to Garmston and Valerie von Frank (2012), in order to craft effective coaching questions that generate reflection and creativity (i.e., mediative questions), you need to ensure that those questions are:

✦ Open-ended: Contrary to closed-ended questions, where answers are limited to yes or no, or are limited to short and surface-level responses, open-ended questions offer perspective to the coachee, allowing him or her to pause and think deeply

before answering. These types of questions create the environment for the coachee to use his or her knowledge and feelings rather than directing him or her in a specific direction.

✦ Invitational: The coach uses an approachable voice (a positive tone; a vocal inflection that goes up at the end of the question, in expectation of a response; and so on) and wording that captures a positive presupposition through the question (e.g., "As a committed professional, do you . . . ?").

✦ Exploratory: The coach uses tentative, unassuming language and plural forms to allow for a variety of responses, homing in on more specifics later if required (e.g., "What might be some of the ways you . . . ?"). This allows him or her to keep the questions open-ended, not make any assumptions or judgments, and remain in the mode of listening for understanding. This opens up scope for a variety of answers and focuses the conversation on the big picture: the beliefs and vision of the coachee.

These three methods of inquiry have proven to deepen thinking and invite contribution from the point of view of the coachee, but there are many types of cognitive processes that can be enlisted when coaching. For example, Robert J. Marzano and John S. Kendall (2007) list the following:

✦ knowledge retrieval (recall and execution),
✦ comprehension (synthesis and representation),
✦ analysis (matching, classifying, error analysis, generalizing, and specifying), and
✦ knowledge utilization (decision-making, problem-solving, experimental inquiry, and investigation).

Instead of trying to be solution based, authentic coaching questions are intentional in the implied cognitive process. For example, if the intended function is to recall information, the question is created in such a way that the function is called up clearly (e.g., "What did you see your students do or say that made you . . . ?").

Indeed, the coach does not try to fix a problem, push a hidden agenda, or evaluate the person; rather, the coach strives to genuinely support the coachee in thinking deeply and constructing new learning by himself/herself without interfering by providing answers, for example.

Use the following stretching exercise to create your own coaching questions.

Stretching Exercise

Crafting Coaching Questions

Given what you've just learned about the aspects of effective coaching questions (open-ended, invitational, and exploratory), how might you ask questions differently in the next few days? Contrast the questions you originally asked your students or colleagues against the same questions transformed into coaching questions.

First, take a look at the following two examples. Yes, the difference between them can sound wordy; however, the effect is significant. Try saying both versions out loud to hear the difference.

Original Question	Coaching Question
(To a student) Can you speak louder, please?	As a learner who values communication, what are some of the ways you could invite everyone to be present with your contribution?
(To a colleague) Why did you change the instructions for the task at the last minute?	As an agile educator, what was some of the data you took into account when you decided to modify the task instructions?

Now it's your turn to practice transforming your questions:

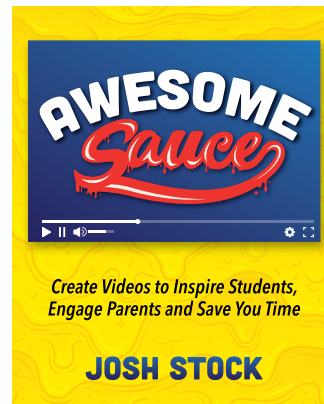| Original Question	Coaching Question
(To a student) _____ _____ _____	 _____ _____ _____
(To a colleague) _____ _____ _____	 _____ _____ _____

Inspiration

Learning to Reflect

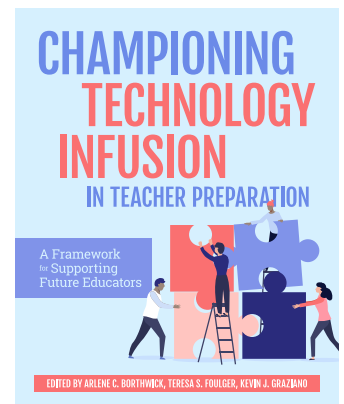Here are some additional resources to further your learning of this new way of thinking and being:

✦ *Becoming a Critically Reflective Teacher* by Stephen Brookfield (San Francisco: Jossey-Bass, 2017): This book provides you with many ways to consider your growth and take action to enhance your skills as a teacher.

✦ Activities from the Presencing Institute based on the implementation of Otto Sharmer's Theory U (presencing.org/#/resource/tools): These resources will allow you to practice various learning and leadership skills (i.e., listening, prototyping, and 4D mapping) while supporting you in your innovation journey.

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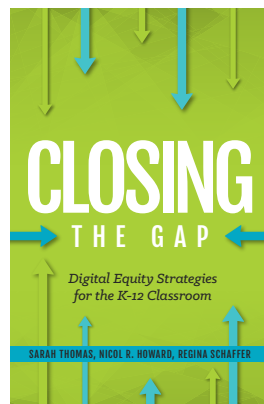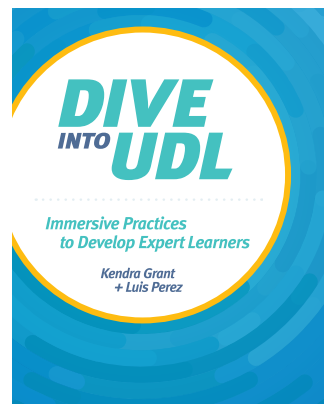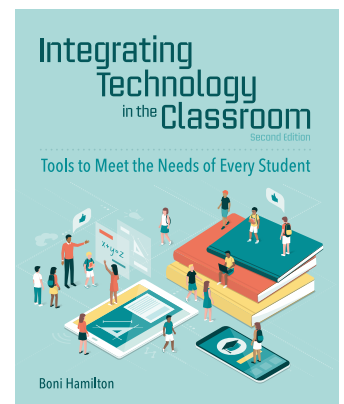print and digital formats
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