Designing for Young Learners

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K–12 students are increasingly enrolling in fully online courses.[1] Even in face-to-face courses, students are commonly provided with online learning activities, especially in school districts that have adopted one-to-one initiatives that provide each student with a laptop.[2] Most school districts expect that teachers will leverage available technology to create activities that strategically combine in-person and online learning activities, a method commonly referred to as *blended learning*. However, simply providing teachers with a room full of laptops does not guarantee that those laptops will be used to provide students with meaningful online or blended learning opportunities.[3] In order to effectively design and facilitate students' online and blended learning, librarians and teachers have to adapt their practices and develop the skills required to do so. However, skills are not enough in and of themselves. Teachers and librarians also need to develop the attitudes and beliefs that will drive them to actually apply their skills in ways that change their practice.

Furthermore, students who are new to online learning require a high level of support. Lowes and Lin explained, "Students not only need to learn a subject online but need to learn how to learn online."[4] Similarly, teachers need to learn how to teach online. Boyer and Kelly explained that "libraries have always been centers of learning how to learn."[5] This is especially true in online and blended environments, and school communities have commonly turned to librarians for guidance in how to learn and teach in online and blended environments. As a result, current and future librarians should develop a clear understanding of online and blended teaching and learning so that they are prepared to support teachers and students in those environments.

Using the Online Technologies to Personalize Learning

One of the primary advantages of online technologies is that they allow students to have a learning experience that is more tailored to their needs. The goal of providing students with a more individualized learning experience is actually explicitly stated in the most widely accepted definition for K–12 blended learning: "Blended learning is any time a student learns at least in part at a supervised brick-and-mortar location away from home *and* at least in part through online delivery with some element of student control over time, place, path, and/or pace."[6]

Graham and colleagues explained that different agents (e.g., students, teachers, and software) can

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make decisions regarding students' learning goals, time, place, pace, and path.[7] There are several terms to describe learning models based on the agent that is making the decisions:

- *Personalized learning* commonly describes the situation when students are provided with control and choice over their learning goals, time, place, pace, and path.
- *Differentiated learning* is similar to personalized learning, except that it is the teacher who is using student learning data and interests to adjust the learning experience for the student.
- *Adaptive learning* is when software uses a student's interests, responses, and behavior to adapt the learning path and scaffolds.

While there are important distinctions among these learning models, there is also considerable overlap. Teachers commonly combine the different models of learning throughout a course and even a single lesson. We have also found that teachers, librarians, and administrators commonly use the term *personalized learning* to describe any learning environment where students' learning experiences are customized to their needs and interests regardless of the agent driving that customization.

The nature of the internet allows students to access any of the learning materials, activities, and assessments that teachers make available online anywhere they are so long as the students have an internet-enabled device with an internet connection. This alone provides students with some flexibility in their learning time, place, and pace. Online content can be static or dynamic. Static content, such as text and videos that are placed online, allow students to adjust their learning time, place, and pace, but what is actually presented does not change based on students' needs. Dynamic content such as games, simulations, and adaptive-learning software can actually personalize students' learning paths by changing what is presented to students based on their behavior, understanding, and interests. Furthermore, librarians and teachers can create and curate content "playlists" that teachers customize for individual students or that allow students to select the resources that they use to achieve mastery. When assessing students' understanding and skills, librarians and teachers can provide them with a choice board containing a menu of options from which students can select. Online and blended learning can also be paired with other more constructivist-driven learning models—such as problem-based learning, project-based learning, and guided inquiry—that provide students with personalized learning opportunities in their learning path.[8]

Designing for Online Interactions

Moore explained that courses are made up primarily of three different types of interaction: student-content, student-teacher, and student-student.[9] All three types of interaction are important for young students' learning. To help facilitate online learning interactions for their students, school districts commonly provide teachers with an online learning management system (LMS), such as Blackboard, Canvas, Desire2Learn, or Schoology. LMSs are increasingly providing *free-for-teacher* accounts that enable teachers to freely access and use an LMS even when it is not provided to them by their school districts. Robust LMSs will contain content pages, assessment tools, gradebook and feedback tools, teacher announcements, and forums where students can interact and discuss course topics. While not as robust, other web-based platforms, such as Google Classroom, Google Sites, and Edmodo, have become popular online platforms for K–12 teachers.

In blended environments, course content can easily be presented either online or using paper. Likewise, student-teacher and student-student interactions can occur online or in person. Because there are advantages and disadvantages to in-person and online learning, the goal of blended learning is to combine the best of both worlds. However, when done poorly, blended learning can actually combine the worst of both worlds. It is important that online activities be blended with in-person activities so that each informs and is dependent on the other. When activities are not blended together, students can become overwhelmed and may feel as if they are actually taking two classes—one online and one in person.

The remainder of this section explores curating and creating online content, followed by a discussion of students' online interactions with other students and their teacher.

Curating and Creating Online Content

Just because content is made available in an online LMS does not mean that it is high quality. When designed poorly, online content can be overwhelming, confusing, and boring. When creating content pages for young learners, Graham and colleagues recommend that teachers and librarians

- chunk longer content into separate, more manageable pages
- use headings and white space to further chunk information on individual pages
- use bullet points or numbered lists when possible
- left-justify paragraph text
- use icons and symbols to cue students' attention to tasks that are commonly repeated
- embed video directly into the page so that it can

be viewed without leaving the LMS
- use at least 12-point type, and larger type when designing content for younger students
- use images purposefully to support the content and engage students[10]

When beginning to blend online and face-to-face activities, often the curation of online content can be a significant first step. One approach is to first search for what may be available for educators to freely use. Material or content that is freely licensed through Creative Commons is also known as open educational resources (OERs). According to Creative Commons, "Open Educational Resources are teaching, learning, and research materials in any medium that reside in the public domain or have been released under an open license that permits no-cost access, use, adoption, and redistribution by others. OER can consist of entire courses, course materials, textbooks, course modules, videos, software applications, among other resources. Such resources are clearly marked with a Creative Commons license."[11]

There are many existing OER repositories. OER Commons, one of the largest collections, is supported by the educational nonprofit ISKME. It provides "Curated Collections," which are developed by digital librarians, specialist librarians who manage and organize online resources. They work to provide an organized array of OERs arranged by topic areas including, for example, Career and Technical Education, Game-Based Learning, Next Generation Science Standards, and many more. OERs can also be searched by subject area, grade level, and type of material. Other OER repositories are more subject- or content-specific, such as the Encyclopedia of Life. This resource seeks to provide open access to information and resources about life on Earth and living nature that are freely accessible and reliable. In addition, some OER databases provide access to peer-reviewed journal articles, such as PLOS, an archive of over 215,000 open access articles focused on science and medicine. These are just a few examples of OER repositories. There are also Creative Commons search tools that allow users to search for open images. They can be particularly helpful for students creating multimedia presentations. This feature also exists within Google, with a few simple steps:

1. Go to Google Advanced Image Search (https://www.google.com/advanced_image_search) for images or Google Advanced Search (https://www.google.com/advanced_search) for anything else.
2. Enter your search terms.
3. In the Usage Rights section, use the drop-down menu to choose what kind of license you want the content to have.
4. Click Advanced Search to view results.

OER Commons
https://www.oercommons.org

OER Commons Curated Collections
https://www.oercommons.org/curated-collections

Encyclopedia of Life
https://eol.org

PLOS
https://www.plos.org

Creative Commons search tools
https://ccsearch.creativecommons.org

Although there are a myriad of resources made available online, copyright rules and fair use guidelines need to be taken into consideration prior to their use, even for educational purposes. Teachers may inadvertently assume, like many students, that if materials are online, they can automatically be used. To help with this issue, a useful checklist to assess fair use is available from the University of Chicago.

University of Chicago fair use checklist
https://www.lib.uchicago.edu/copyrightinfo/fairusechecklist.html

Librarians are instrumental in guiding educators and helping them locate OERs that are made available under Creative Commons. When necessary, teachers and librarians can easily create content video presentations using free online tools, such as Screencast-o-matic, that allow them to record audio combined with either a webcam video of them talking, what is being shown on their computer screen, or both. While these online tools can be simple to use, it's more difficult to actually create videos that students will watch. Guo, Kim, and Rubin found that students are most likely to view videos that

- are shorter than six minutes
- combine video of the narrator with the slides
- show the teacher writing or drawing
- show the narrator in personal settings
- contain a narration that is enthusiastic[12]

Screencast-o-matic
https://screencast-o-matic.com

For generations, teachers have used narrative and storytelling to engage learners, make learning

relevant, and connect new concepts to prior knowledge and experiences. Video allows this approach to be even more engaging, illustrative, and accessible. The use of video is ideal because it requires limited technology expertise and can be done with existing technology resources. It can also be used to cultivate personalized learning to the extent that the teacher is able to build meaning from situations through videos that are relevant to students' personal interests, motivations, and existing prior knowledge.[13]

When creating online content, educators also need to be aware of universal design principles that aim to reduce accessibility barriers for all learners, regardless of whether or not students have disabilities. Although it is beyond the scope of this chapter to go into great depth on universal design principles, two relatively easy considerations include using alt-text for images so that they can be described by screen readers and adding captions to any videos that are created. There are free online tools, such as Subtitle Horse, that will create captions for uploaded videos, and YouTube can also automatically add captions. However, with any automated tool, accuracy should be double-checked, as errors can occur due to mispronunciations, audio quality, accents, speaker pace, or background noise. For additional information about Universal Design for Learning in an online setting, please see the chapter on differentiated instruction by Keeler and colleagues in *What Works in K–12 Online Learning*.[14]

Subtitle Horse
http://subtitlehorse.com

Online Communication

Online technology can help to customize students' interactions and feedback. While face-to-face communication can be especially engaging and synergetic, not all students can participate equally, especially those who might be more introverted, who are learning English, or who have disabilities. In contrast, online students can communicate asynchronously, providing students with an equal opportunity to participate. The flexibility that the online environment provides also affords students time to reflect and formulate their ideas before they share them with others. Furthermore, online technologies are increasingly providing students with choice in how they want to communicate. For instance, Flipgrid is a popular communication platform that allows participants to easily post video comments for others to view and reply to. Other tools, such as VoiceThread and Padlet, actually provide participants the option to post text, audio, or video comments.

Flipgrid
https://flipgrid.com

VoiceThread
https://voicethread.com

Padlet
https://padlet.com

Teachers and librarians can also provide students with more targeted support and feedback using audio and video recordings. For instance, LMSs such as Canvas have integrated audio and video feedback communication into their online gradebooks. Teachers and librarians can also use screen recording tools if video communication is not supported by their LMS. Following several research articles examining online and blended teachers' video communication and feedback, West and colleagues provided the following guidelines:

- Type out ideas before making the video. The text summary can also be provided to students.
- Avoid rerecording your videos by embracing imperfections. Students have reported that they prefer it when teachers speak naturally as they would in person.
- Keep the videos relatively short (under ten minutes).
- Provide whole-group as well as personalized communication and feedback. For instance, a teacher may choose to post a video announcement for the entire class.
- Be authentic and personable in the recordings.
- Use video communication strategically. For instance, video screen recordings are probably best when students require detailed or extended feedback on their online projects, but a video is unnecessary when the feedback is relatively straightforward.[15]

It not uncommon for teachers to feel uncomfortable when creating video messages for students at first, but they find that they quickly become more and more comfortable with experience.

Conclusion

The expansion of blended and online learning in K–12 schools has the potential to dramatically change how teachers teach and learners learn. With all of the disruption beginning and continuing this shift represents, one thing is clear—libraries will remain "centers of learning how to learn."[16] Now more than

ever, students and teachers will turn to their librarians with questions and requests for assistance as they move to blended and online environments. As a result, librarians are in a prime position to help teachers and students gain the knowledge and skills required to be successful. In this chapter, we highlighted only a few strategies, principles, and resources to assist along the way. We encourage librarians to use their expertise to research these topics further and to connect with other librarians and teachers so that they can continue to support one another along this important journey. As online designers, librarians play a pivotal role in educating students and preparing them to meet the challenges of the highly connected society in which we live.

Notes

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