SETDA LEADERSHIP TECHNOLOGY INNOVATION LEARNING

THE ACCESSIBILITY OF LEARNING CONTENT FOR ALL STUDENTS, INCLUDING STUDENTS WITH DISABILITIES, MUST BE ADDRESSED IN THE SHIFT TO DIGITAL INSTRUCTIONAL MATERIALS

SETDA Policy Brief, prepared in partnership with EducationCounsel LLC

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In the fall of 2012, SETDA released a groundbreaking report, *Out of Print: Reimagining the K-12 Textbook in a Digital Age*, which documented and provided advice to states and districts on how to manage the ongoing shift from traditional print-based instructional materials to digital content. While the advantages to increasing the use of digital content by students and teachers are significant, the policies and practices associated with a successful transition are still emerging. The purpose of this series of policy briefs is to shine a light on specific policies and practices that we believe are key to keeping efforts to employ digital content in K-12 education on track and on target.

Introduction

We live in a time of rapid technological advancement, with innovations in education holding great promise for improving teaching and learning, particularly for students with unique needs. High-quality digital educational materials, tools, and resources offer students relevant, up-to-date, and innovative ways to acquire knowledge and skills. Created both by traditional publishers and increasingly by educators, digital content is a growing presence in the nation's classrooms. Technology-rich learning environments, supported by digital materials, are appealing to today's students and teachers who wish to use the transition to digital as a way to personalize and otherwise improve instruction.

Digital learning materials – such as lesson plans, videos of instructional practice, and formative assessments – can improve the classroom experience for all students, and they may hold particular promise for students with disabilities. Digital content can be designed and developed with flexibility and customization capabilities at the outset, reflecting the principles of universal design, and can be revised in a more timely manner than the labor-intensive and costly process of updating traditional, static materials like printed textbooks. Further, when developed as open educational resources (OER), high-quality digital learning materials can be broadly disseminated and modified by other educators to meet their students' needs and interests. In other words, digital content can be designed, created, and refined over time in a way that recognizes and responds to the full spectrum of learner variability and, where this content is licensed as OER, these tools and resources can be shared across classrooms and modified, as appropriate, to meet individual student needs.

What are Open Educational Resources (OER)?

OER are "teaching and learning materials licensed in such a way that they are free and may be used, reused, remixed, and otherwise customized to meet specific needs."[*]

In other words, OER are teaching, learning, and resource materials, tools, and media that reside in the public domain and may be used and repurposed freely by educators, students, and self-learners.

[*] See SETDA, *Out of Print: Reimagining the K-12 Textbook in a Digital Age* (2012), available at http://www.setda.org/priorities/digital-content/out-of-print/

Purpose/Goals

This paper summarizes issues and ideas that education leaders should consider when examining the accessibility of digital content for all students, including students with disabilities. It provides recommendations for state and district policy regarding the development, use, and distribution/sharing of digital tools and resources to improve students' learning experiences. These recommendations focus on:

- Establishing a clear vision for the use of accessible digital learning materials and communicating that vision to relevant stakeholders, including content-creators and content-users;
- Encouraging the development and use of accessible open educational resources to maximize flexibility and customization options available to educators to meet individual student needs;
- Providing educators with professional learning opportunities;
- Ensuring that educators have access to online repositories of quality accessible digital content;
- Investing in research and evaluation to assess the impact of accessible digital learning materials on student achievement and engagement and to share best practice; and
- Exploring fiscally sound ways to support the creation and use of digital content.

The recommendations of this paper regarding accessible digital learning materials are important and relevant for enhancing the educational experiences of all students. In some instances, the paper focuses on students with disabilities, given specific requirements in federal (and corresponding state) law that are placed on schools with respect to the education of these students. Before turning to these recommendations, this policy brief discusses open educational resources, examines the Universal Design for Learning Framework, and outlines federal law requirements regarding accessibility of instructional materials.

Open Educational Resources

Digital educational resources, designated as OER using a Creative Commons or similar intellectual property license, empower educators to develop, use, distribute, and remix educational materials.[1] OER can be copyrighted to permit derivative works, which build on previously created work and may better meet the interests and needs of a particular educator's students. The following table describes the six main Creative Commons licenses:

[1] *See* "Clarifying Ownership of Teacher-Created Digital Content Empowers Educators to Personalize Education, Address Individual Student Needs" (SETDA, March 2014).

OER Licenses

There are multiple licensing options for states to support OER. Creative Commons, a nonprofit organization that offers free copyright licenses to facilitate sharing and use of teacher-created work, has six main licenses so that reuse, revision, and redistribution rules are defined at the outset. The six options (with their corresponding symbols) are as follows:

	**Attribution**: "lets others distribute, remix, tweak, and build upon your work, even commercially, as long as they credit you for the original creation. This is the most accommodating of licenses offered."
	**Attribution ShareAlike**: "lets others remix, tweak, and build upon your work, even for commercial purposes, as long as they credit you and license their new creations under the identical terms….All new works based on yours will carry the same license, so any derivatives will also allow commercial use."
	**Attribution No Derivatives:** "allows for redistribution, commercial and non-commercial, as long as it is passed along unchanged and in whole, with credit to you."
	**Attribution Non-Commercial**: "lets others remix, tweak, and build upon your work, and although their new works must acknowledge you and be non-commercial, they don't have to license their derivative works on the same terms."
	**Attribution Non-Commercial ShareAlike:** "lets others remix, tweak, and build upon your work non-commercially, as long as they credit you and license their new creations under the identical terms."
	**Attribution Non-Commercial No Derivatives**: "is the most restrictive…, allowing others to download your works and share them with others as long as they credit you, but they can't change them in any way or use them commercially."

Creative Commons, "About The Licenses," available at http://creativecommons.org/licenses/.

Universal Design for Learning

All students arrive at school (whether brick-and-mortar buildings or virtual and blended models) with a variety of skills, interests, and needs. Many students have learning, physical, cognitive, and/or sensory disabilities that impact the ways in which they learn. One-size-fits-all learning materials fail to account for this learner diversity. Alternatively, classroom materials can be designed and developed in ways that make them inherently accessible. The concept of "universal design," first applied to architectural practices, was recognized expressly in the 2004 reauthorization of the Individuals with Disabilities Education Act, which provided the following definition:

> The term "universal design" means a concept or philosophy for designing and delivering products and services that are usable by people with the widest possible range of functional capabilities, which include products and services that are directly usable (without requiring assistive technologies) and products and services that are made usable with assistive technologies.[2]

[2] Individuals with Disabilities Education Act, 20 U.S.C. § 1401 (citing 29 U.S.C. § 3002).

The Universal Design for Learning (UDL) framework developed by the Center for Applied Special Technology provides for the development of accessible learning materials that recognize and account for the needs of all students at the outset.[3] UDL includes the foundational concept of "universal design" described above and establishes the following three primary principles for curricula development:

1. Provide multiple means of **representation**, presenting information and content in different ways;
2. Provide multiple means of **action and expression** so that all students can demonstrate and express what they know; and
3. Provide multiple means of **engagement**, stimulating interest and motivation for learning

These UDL principles can be applied to instructional goals, methods, materials, and assessments. And they hold particular promise for digital content, with digital text and media providing much more inherent flexibility and learner support than traditional media formats. This is especially true where digital content is not device-dependent and where it is licensed as OER, with permission to create derivative works, because educators then can translate and transform the materials into alternate formats that address learner differences.

Legal Landscape for Students with Disabilities

Considering how to create accessible digital learning materials, or how to make existing materials accessible, for students with disabilities not only makes for good education policy; it also is required under federal law. Federal civil rights and education law (as well as corresponding state statutes) require that students with disabilities be able to access and participate in the general education curriculum. Specifically, the nondiscrimination principles in Title II of the American with Disabilities Act and Section 504 of the Rehabilitation Act of 1973 require that students with disabilities not be discriminated against in receiving the full and equal enjoyment of the programs, services, and activities at public school districts.[4] Stated differently, students must be afforded the opportunity to acquire the same information, engage in the same interactions, and enjoy the same services as non-disabled students. And the educational principles in the Individuals with Disabilities Education Act and the Elementary and Secondary School Act address the unique learning needs of eligible students with disabilities, requiring that they be provided with a free appropriate public education and be taught to the same academic standards set for all students.

To satisfy federal nondiscrimination standards, a public school must offer fully accessible materials or provide reasonable modifications and accommodations to ensure that students with disabilities are provided with the means to access the benefits of the educational program in an

[3] See Nat'l Ctr. on Universal Design for Learning, UDL Guidelines—Version 2.0 (CAST 2011), available at http://www.udlcenter.org/aboutudl/udlguidelines (last accessed Oct. 27, 2013).

[4] Title II of the Americans with Disabilities Act, 42 U.S.C. §§ 12101 et seq., and regulations, 28 C.F.R. Part 36; Section 504 of the Rehabilitation Act of 1973, 29 U.S.C. § 794, and regulations, 34 C.F.R. Part 104. See also U.S. Dep't of Educ., "Dear Colleague" letter (May 26, 2011), available at http://www.edweek.org/media/civilrightletter-blog.pdf; U.S. Dep't of Educ., "Frequently Asked Questions" (May 26, 2011), available at http://www2.ed.gov/about/offices/list/ocr/docs/dcl-ebook-faq-201105.pdf; U.S. Dep'ts of Educ. and Justice, "Dear College or University President" letter (June 29, 2010), available at http://www.ada.gov/kindle_ltr_eddoj.htm.

equally effective manner with substantially equivalent ease of use. Joint guidance from the U.S. Departments of Education and Justice explain that schools must ensure that blind or visually impaired students are afforded the same benefits and opportunities offered via electronic book readers with "substantially equivalent ease of use."[5] For example, many blind or visually impaired students use Braille to access print text. To access digital text, these students might use devices that include text-to-speech functionality.

Ultimately, schools are not barred from using materials and technological devices that are not accessible for all students – indeed, it is unlikely that any one material or device will be universally accessible to all students, given students' diverse learning abilities and needs. Where a single accessible option is not available, tools and resources must be modified appropriately or students must receive accommodations that make the material available and useable for all students.[6] A school must assess whether a proposed accommodation or modification ensures that educational opportunities and benefits are equally available, in as timely a manner as possible, for students with disabilities.

In addition to these civil rights statutes, the Individuals with Disabilities Education Act (IDEA)[7] and the Elementary and Secondary Education Act[8] require that students with disabilities receive the necessary supports to participate in the general education curriculum. In particular, IDEA mandates that all students with disabilities receive a free appropriate public education, with inclusion in the general curriculum to the greatest extent possible. Eligible students must receive an individualized education program (IEP) that includes appropriate services, supports, and ancillary aids, provided in a timely manner.[9] These services, supports, and aids may nclude high-quality accessible instructional materials (AIM)[10] and assistive technology devices[11].

School districts must have processes and procedures in place to identify and evaluate students with disabilities in order to provide them with appropriate supports to meet their individual needs and to ensure for them an equal educational opportunity to access the information and programs used by other students. This is a highly sophisticated process, involving the individualized consideration of a student's unique needs, skills and abilities, and preferences, to help ensure that no student with a disability is denied an opportunity to participate in or benefit from the general education curriculum.

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[5] See U.S. Dep'ts of Educ. and Justice, "Dear Colleague," supra note 4.

[6] For example, the Department of Education's Frequently Asked Questions guidance on electronic book readers (May 26, 2011), supra note 4, advised that schools are not always required to provide information through the same form of technology. The Department observed that accommodations could (depending on the circumstances) include a different technological device or a traditional media alternative.

[7] Individuals with Disabilities Education Act, 20 U.S.C. §§ 1400 et seq., and regulations, 34 C.F.R. Parts 300 and 301.

[8] Elementary and Secondary School Act, 20 U.S.C. §§ 6301 et seq., and regulations, 34 C.F.R. Part 200.

[9] See 20 U.S.C. §1414; 34 C.F.R. §§ 300.320-300.324.

[10] The IDEA explicitly focuses on AIM for students with print disabilities, referring to specialized formats of Braille, large print, audio, and digital text. 20 U.S.C. § 1474(e)(3)(D) (citing 17 U.S.C. § 121(d)(4)).

[11] Under the IDEA, every child's IEP team must "consider whether the child needs assistive technology devices and services" in order to receive a free appropriate public education. 20 U.S.C. § 1414(d)(3)(B)(v); 34 C.F.R. § 300.324(a)(2).

Print Accessibility

As the use of digital materials in schools intensifies, existing initiatives in print accessibility are important resources for states and districts to consider. Thought leaders, including the following, demonstrate through their work the vital importance of proactive accessibility in educational materials:

- ***The National Instructional Materials Accessibility Standard (NIMAS) Center*** maintains and advances the NIMAS, which guides the production of specialized formats of print materials, including Braille, audio, large print, and digital text, of textbooks and related instructional materials. See http://aim.cast.org/about_nimas_ctr#.Us1eFtJDt8E.
- ***The National Center on Accessible Instructional Materials (AIM)*** serves as a resource and technical assistance provider to stakeholders (including educators, publishers, and media producers) interested in implementing AIM and NIMAS. See http://aim.cast.org/about_aim_ctr#.Us1eJdJDt8E.
- ***American Printing House for the Blind*** creates educational products and services, including accessible textbooks, for students who are blind or visually impaired. See http://www.aph.org/.
- ***Bookshare*** creates and maintains accessible reading materials using a variety of means to produce digital instructional materials. See https://www.bookshare.org/.
- ***Learning Ally*** *provides an extensive accessible audio book (including textbook) library. See* https://www.learningally.org/.

With these legal considerations in mind, digital resources hold enormous potential for accessibility. More flexible and malleable than traditional, static tools (e.g., hardbound textbooks, printed worksheets, etc.), electronic content can be built with embedded accessibility functions and has the capacity to be modified more easily, as needed, over time. Digital educational resources designated as open educational resources via intellectual property licenses can further facilitate the iterative processes of modification and customization of digital content, processes that can be particularly important for students with disabilities.

All of this must be done purposefully, though, with recognition at the outset of (1) UDL principles during the creation of these resources, given their fluid nature, and (2) licensing arrangements that facilitate sharing and alterations, since rigid copyright regimes inhibit the modifications made easier by digital content. Otherwise, digital content can exacerbate access issues for students with disabilities as digital content is updated, making it a "moving target" for accessibility.

Recommendations

Digital learning materials are used increasingly in our schools and classrooms, including in virtual and blended learning spaces. These tools and resources have the potential to be created with inherent accessibility functions, and policymakers have a legal responsibility to ensure that this development does not leave students with disabilities behind. With educators increasingly creating digital content, state and district policymakers should ensure that educators are informed about OER, including attendant licensing options, so that materials can be used by the broadest range of learners. The following recommendations therefore both represent good educational policy and respond to federal legal requirements.

1. Establish a Clear Vision

State and district leaders should establish a clear vision for the integration and increased use of accessible digital content and technologies in their classrooms; communicate that vision to publishers, other vendors, and educators; and expressly acknowledge the role that these tools and resources can play in enhancing the educational experience of all students, including students with disabilities. To support this vision, a state and its districts should have explicit policies that address the importance of accessibility in planning for the increased use of digital content, with recognition of UDL principles.

2. Support the Flexibility and Customization Options Provided by Accessible Open Educational Resources

Policymakers should provide clear, useful guidance on licensing accessible digital tools and resources as OER so that high-quality resources can be shared, modified to meet individual student needs, and used broadly across classrooms. Just as education officials elicit bids from publishers and other vendors for print materials that meet the National Instructional Materials Accessibility Standard (NIMAS)[12], officials should implement policies and standards that encourage the acquisition and creation of digital materials that can be hosted and delivered in ways that embed accessibility functions and enable additional modifications "on the fly," especially given the iterative nature of digital content refinement. OER is a particularly promising approach for this because digital materials licensed as OER can be used broadly, improved continuously, and tailored by educators to meet students' diverse interests and needs.

3. Provide Technical Assistance and Professional Learning Opportunities to Educators

Educators, including teachers, specialists, and administrators, increasingly serve as instructional content-creators, producing digital materials that are used to enhance instructional practice and student experience. Through OER licenses that enable broad dissemination, these materials can be used by other educators who may modify the tools and resources to meet their students' needs and interests.

Given these developments, educators should receive technical assistance and be able to access professional learning opportunities – and, as appropriate, be incentivized – to create, use, and modify accessible digital content. These opportunities should:

- explore ways in which digital content can be integrated into the classroom to improve instruction for all students, including students with disabilities;

[12] NIMAS is a technical standard used by publishers to produce files that can be employed to develop specialized formats of instructional materials (e.g., Braille and audio books) for students with visual impairments and other print disabilities. Congress adopted NIMAS as part of the IDEA reauthorization in 2004. 20 U.S.C. § 1412(a)(23)(A); *id.* at § 1474(e)(3)(B).

Currently, all 50 states and the District of Columbia have opted to coordinate with the national center that serves as a repository for NIMAS files. As such, when a state or district purchases print instructional materials, it must require the publisher to provide electronic files based on the NIMAS or purchase instructional materials from the publisher that already are produced in, or may be made into, specialized formats.

- empower educators by providing pedagogical and technical strategies to design, develop, and deliver OER learning experiences; and

- inform educators about copyright and licensing options, including the free licenses developed by Creative Commons, to enable sharing and refinement.

Finally, all educators should be aware of legal requirements pertaining to accessibility. Training on digital content should be provided to the teams of educators that create individualized education programs for students with disabilities, pursuant to the IDEA.

4. Ensure Educator Access to Online Repositories of Quality Digital Content

Repositories of digital materials can be maintained by various actors including the state, a consortium of states, or third-party entities, and have the capability to house content from more than one state. These repositories can be aligned to state standards to enhance their ability to be integrated into the general curriculum and can help educators identify and locate accessible digital materials. Moreover, where these materials are licensed as OER, the repositories can support continuous improvement of the resources as educators refine and improve upon them.

As part of this effort, states and districts should assist with quality assurance. At the outset, an important quality measure – the degree of alignment between an OER and the state's standards – may be best accomplished where states publish the standards' metadata (information embedded within the digital framework that describes the material's content and context) to facilitate seamless and verifiable connections between high-quality resources and the standards.

States and districts also should ensure rigorous and appropriate vetting of available materials consistent with existing, educationally sound approval practices and identify approved digital repositories. Part of this inspection should include a purposeful consideration of the accessibility of the resources. For example, Achieve's rubric for evaluating OER objects includes a standard on accessibility, prompting the reviewer of digital content to consider whether the material is, for example, available in certain alternative formats and compliant with certain industry standards.[13] Another useful reference for creating and/or evaluating the accessibility of e-books formatted to the EPUB3 specification (a free and open e-book standard, designed to optimize text for particular devices) is provided by the DIAGRAM Center at Benetech.[14] States and districts might rate teacher-created content on various metrics, including the degree to which the materials embed accessibility functions. An advisory approach to quality review may prove best for OER materials since, under most OER licenses, these resources can be altered and improved over time.

Finally, states and districts should ensure or encourage proper and functional organization of OER materials in a repository via policies that provide for tagging and discoverability aligned to state content standards. For example, a request for proposals can include a requirement that publishers of digital content or repository providers ensure that digital material are discoverable through available metadata. Educators will be better able to navigate a repository with items that are searchable and browsable by various classifications.

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[13] Achieve, Rubrics for Evaluating Open Education Resources (OER) Objects (Nov. 18, 2011), available at http://www.achieve.org/files/AchieveOERRubrics.pdf (last accessed Oct. 27, 2013).

[14] DIAGRAM Ctr., Top Tips for Creating Accessible EPUB 3 Files (last updated May 28, 2013), available at http://www.diagramcenter.org/standards-and-practices/54-9-tips-for-creating-accessible-epub-3-files.html (last accessed Oct. 27, 2013).

5. Invest in Research and Evaluation

To support the continuous improvement of instructional practice and student achievement, policymakers should invest in research and evaluation to understand the effect that the explosion of digital content, including OER, and technological devices are having on teaching and learning practices and results. Part of this evaluation should include attention to the achievement of students with disabilities. Partnerships with institutions of higher education and research organizations, as well as philanthropic support, could be explored as avenues to assist with research and evaluation capacity. In addition to macro-level research, educators should be encouraged to evaluate the degree to which digital content is improving outcomes for students, including students with disabilities, in their schools and classrooms.

These research efforts also can assist policymakers with identifying best practices regarding (1) the design and creation of accessible digital content and (2) its integration in the classroom. These practices then can be shared broadly for greatest impact.

6. Address Issues of Funding

Finally, states and districts must address the need for funding to support the creation and use of accessible digital content and technologies (which can be costly). Some policymakers may find that funds historically reserved for traditional learning materials can be repurposed for digital content. As noted above, open educational resources also hold significant promise for dramatically reducing the cost of content creation, acquisition, and distribution. States and districts also should explore opportunities to take advantage of efficiencies of scale, for example by encouraging multidistrict and multistate procurement of accessible technological devices, digital materials, or online learning opportunities.[15]

Conclusion

Technology is transforming education, expanding choice, and enhancing educational access and points of entry for students. Digital learning materials can be built with inherent accessibility and where licensed as open educational resources, can be modified and enhanced over time to reflect learner interests and needs. This can result in real value for all students, including students with disabilities. As the U.S. Departments of Justice and Education have observed:

> Technology is the hallmark of the future, and technological competency is essential to preparing all students for future success. Emerging technologies are an educational resource that enhances the experience for everyone, and perhaps especially for students with disabilities. Technological innovations have opened a virtual world of commerce, information, and education to many individuals with disabilities for whom access to the physical world remains challenging. Ensuring equal access to emerging technology in…classrooms is a means to the goal of full integration and equal educational opportunity for this nation's students with disabilities.[16]

[15] For example, states might explore the possibility of reciprocity for course choice programs. Online learning opportunities have the potential to support personalized systems of learning that allow students to progress through courses at their own rates. These online offerings can expand quality course options for all students, particularly those who need special curricular offerings, like students with disabilities.

[16] See U.S. Dep'ts of Educ. and Justice, "Dear Colleague," supra note 4.

While, historically, classroom materials have come in a "one size fits all" form and method of delivery, digital content can be adjusted in real time to meet diverse student needs. In order to harness this potential, however, digital material must be the result of purposeful design and planning that takes into account considerations of accessibility at the outset. State and district policies regarding digital content, including on OER, can help facilitate this.

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