



# Making materials accessible to students in higher education institutes: Institutional obligations, methods of compliance, and recommendations for future action

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## Key points

- Current publishing restrictions cause duplicated – and wasted – effort to delivery of accessible information to students.
- Universities have a legal obligation to provide access, but this is not required from publishers.
- Initiatives to support access are helpful, but do not completely resolve the accessibility problems.

## INTRODUCTION

In 2008, 10.8% of students enrolled in post-secondary institutions had a disability (U.S. Government Accountability Office, 2009). This represents over two million students. The largest subgroup of students with disabilities is those with learning disabilities (including reading disorders – the official term for dyslexia as published in the *Diagnostic and statistical manual of mental disorders*, version 5). According to the National Longitudinal Transition Studies, the increase in the rate of enrollment of young adults with learning disabilities in any type of post-secondary education was double that of the general population from 1990 to 2005 (18% vs. 9% increase) (Cortiella & Horowitz, 2014; Mull, Sitlington, & Alper, 2001).

When a student requests an accommodation to be made for a disability (i.e. curricular access and other modifications to campus policies or processes), universities are legally obligated to provide it if the student qualifies. At most US institutions, there is an established method for students to document their disabilities and register for services and other accommodations. This voluntary process is based on state and federal regulations, as well as university policy. Colleges and universities may have little time to prepare for a student's needs and little awareness of how many students may need support in any given year. Semester by semester, the courses and instructors involved in accommodations vary. A critical factor in the support of students with disabilities is the institution's ability to rapidly serve

those needs. Most higher education institutes (HEIs) work diligently to provide adequate services. A common accommodation is making course materials accessible for students who are blind, have a visual or motor impairment, and students with reading disorders.

This includes materials produced by university personnel themselves as well as those provided by external publishers. In order to do that, staff usually need to obtain or create digital versions of those materials, modify them, and then distribute them to the student(s), ideally at the same time that other students gain access, although disabled students frequently have to wait for their adapted materials to be available.

With advances in technology, it is possible to supply a digital version of a text that will meet a student's needs. However, acquiring or producing these versions is not always simple. In providing instructional materials for students with print disabilities, because they are not commercially available from publishers, institutions navigate a variety of sources to see if digital formats already exist. They also request electronic copies directly from publishers, or through a mediated service. As a last resort, a school may need to scan a work from print. Regardless of original source, a digital file will need to undergo significant reformatting before delivery to a student. Numerous institutions may be seeking the same texts at any given time, but they have no mechanism for sharing. The work that goes into a single file may represent many hours of labour. The same work on the same file may be replicated at multiple institutions every semester.

## WHAT MAKES COURSE MATERIALS 'ACCESSIBLE'?

Accessibility is often addressed on an individual basis. For a single student requesting an accessible version of an assigned text for class, accessibility typically refers to a version of the text that can be or has been manipulated to meet the student's need(s). Whether a student will use the copy electronically (such as with screen reader software or other assistive technologies) or needs a fixed version (e.g. large text, braille), an accessible file will be a digital copy of a text with markup of headers and other formatting features; alternative text (alt text) to describe images and graphs; notification of page breaks and marginalia; and so on. In short, the accessible file must replicate the structure of the document in addition to the content of the text.

In the case of web content, accessibility standards help web content designers and developers identify and address accessibility issues. The Web Content Accessibility Guidelines (WCAG) 2.0 are published by the World Wide Web Consortium (W3C, [www.w3.org/WAI/intro/wcag](http://www.w3.org/WAI/intro/wcag)). This standard consists of 12 guidelines, each with three checkpoint levels for individual success criteria for web developers to meet: Level A, Level AA, and Level AAA. Having this specific standard allows anyone developing web content to check for accessibility concerns and modify their designs accordingly.

However, for Disability Resources and Services (DRS), there is no corresponding accessibility guideline for traditional print-based content. Many hope that EPUB 3 will become the *de facto* standard for digital publishing so that standards for accessibility can be built into early production of content. In July 2016, the Book Industry Study Group (BISG) released the quick start guide to accessible publishing (BISG, 2016). It covers the rationale for ensuring accessibility, specific steps to make content accessible, and the legal requirements for accessibility. It is aimed at the publishing industry with a goal that new content will be 'born accessible', but the guide can be used by anyone.

### Workflow

In order to assist students, each school must obtain or create accessible materials. If publishers cannot provide appropriate versions, or do not respond to requests, then schools do the reformatting work themselves – thereby remedying a problem caused by the lack of 'born accessible' publications and removing the incentive for publishers to invest in the accessibility of their products. Custom work and faculty consultations may be needed to translate or interpret images, graphs, or other supplementary materials embedded in texts, or to convert the publisher-supplied PDF into the needed file format. Multimedia materials present special challenges, such as transcribing subtitles for films, or creating new versions of films with voiced descriptions for visual components. Despite all these challenges, the work of reformatting and delivering the final product typically takes place within the organizational confines of the DRS at each HEI.

The scale of these services can range from serving a single student to serving thousands at our largest institutions. Each student makes requests based on their individual course of study. A single class may require one large textbook, dozens of scholarly articles, a stack of early American novels, or an infinite number of other variations. The vast range of course subjects and pedagogical approaches is a cornerstone of American higher education. The innumerable curricular differences between institutions are also valued. In the context of accessibility, this academic freedom creates a cost in terms of removing the barriers to access faced by students with disabilities, so long as the responsibility for accessible course materials rests solely with the colleges and universities themselves.

With respect to supplying accessible instructional materials, the challenges for colleges, universities, and students have been well documented. A key text is the *Report of the Advisory Commission on Accessible Instructional Materials in Post-secondary Education for Students with Disabilities* (AIM, 2011), which studied the state of accessible materials and made 18 recommendations to Congress. The fact that so little has changed since the time of the Commission's report is further evidence of the pernicious nature of this set of challenges for students and higher education as a whole.

In providing accessible instructional materials, a typical workflow will generally follow these steps:

- Each semester, students notify DRS that they wish to use the services for accessible instructional materials and provide information about the courses they are taking.
- The DRS researches which materials need to be provided in alternative form and search for accessible copies. If a suitable version is unavailable, the DRS searches for a version that can be easily modified to be accessible.
  - (a) The search frequently starts with sources of suitable materials, such as titles available from Reading Ally (discussed below). In some cases, a school will ask members of professional listservs if anyone has already modified a particular text and can share a copy.
  - (b) The second attempt is to acquire a copy from the publisher. DRS staff identify whom to contact at the publishing house, make the request, and hope for a timely response. A major vehicle for this is the AccessText Network (ATN), which serves as a middleman between HEIs and major textbook publishers. ATN and other services are discussed below. Some publishers will provide an electronic version of the text. Others will provide a basic image or low-quality copy of the final text. The time frame for a response varies widely. While ATN will typically respond within 72 hr, some publishers can take 8–12 weeks to respond.
- If an electronic copy of a text is unavailable or of very poor quality, or if the publisher is non-responsive, a school will obtain a print copy and scan it, occasionally resorting to disbinding the text to obtain a good scan. The scan is run through optical character recognition (OCR) software and then further modified.

- Each student is served individually, so the processing of the digital file will depend on the needed output for the student. In some institutions, DRS has established standard file formats from which students can choose. Other institutions will adapt their work to the student's preferences. For example, a blind student may want some texts brailled, but want others provided in a structured Microsoft Word document. External service providers may be needed to work on some projects (such as braille and video captioning) and subject experts may be needed for some materials (e.g. interpreting graphs for a prose description).
- When the copy is ready, the file is distributed to the student.

## DIFFICULT DISCIPLINES: A PARTICULAR CHALLENGE

Some content areas are particularly difficult to make accessible and it is not the number of students or volume of requests as much as the nature of the requests that determines the amount of effort required.

Science, technology, engineering and math (STEM disciplines) are by far the most difficult and the highest in demand. The common use of equations, images, charts, and graphs make accessibility requests very challenging. Formulae and equations are difficult to convert and may require both DRS doing the conversion and the student using the material to learn markup systems like MathML. Images need text descriptions far beyond the image caption that may be provided. Charts and graphs may need to be depicted tactiley for some students. Due to their lack of expertise in certain subjects, DRS staff may need to solicit help from the teaching faculty or graduate assistants to create these descriptions and interpretations.

The second most often identified area of difficulty is languages other than English. Staff need to markup the change between the text language and English. Different scripts can be challenging for anyone not familiar with them and hard to convert. Furthermore, numerous images, tables, and multimedia may need special attention for conversion/adaptation.

There are additional subjects that, as a whole, have created challenges for schools. It is impossible to predict when these areas will be in demand. However, regardless of the particular discipline, the nature of the challenge is consistent: more specialized subject matter and increased use of images, media, tables, charts, formulas, and non-Roman alphabets are some of the most resource-intensive conversions. With the amount of effort that goes into creating accessible materials, once a school makes an advanced calculus textbook accessible, the thought of another school repeating that same work seems absurd.

## EXISTING RESOURCES

Several independent services and organizations offer assistance with accessibility: these include Bookshare, ATN, and Learning

Ally. All organizations are excellent in their own way, delivering content to persons with disabilities, yet they are still insufficient for several reasons.

### AccessText Network

ATN serves as a 'middleman' between publishers and HEIs. It is administered by AMAC Accessibility Solutions at the Georgia Institute of Technology, under the auspices of the Board of Regents of the University System of Georgia. Colleges and universities can join ATN for free. Then their DRS can request electronic files via ATN's online interface. ATN sends the requests to the publisher. Publishers provide the file to ATN and ATN provides the file to the requesting school. The average turnaround for a file is 3 days. Files can be requested in multiple formats (DOC, EPUB, PDF, RTF, XML); however, it is up to the publisher to determine the file type delivered. ATN tracks all the requests. Use of ATN has grown substantially from 22,000 in 2010 to 100,000 in 2015 (see <http://accesstext.org>).

Given the large volume of requests, it is sensible for publishers to provide a streamlined workflow to reduce the difficulty of managing requests. However, the features of ATN are primarily designed to optimize efficiencies for the publishers, often at the expense of the HEI. To join, each HEI signs a membership agreement with specified terms of use (see [http://accesstext.gatech.edu/wiki/Authorized\\_User\\_Membership\\_Agreementlast](http://accesstext.gatech.edu/wiki/Authorized_User_Membership_Agreementlast)). Some of these terms (as in the agreement on 5 September 2016) include:

I will only provide an Alternative Text to another Authorized User when both I and the Authorized User who needs the Text have received permission from the Publisher.

I acknowledge that if I receive a request from a Qualified Student for an Alternative Text that I have already supplied to another Qualified Student, I must submit a new request for permission and, if the Publisher so requires, not redistribute the file until I receive express permission to do so.

I agree to securely archive or dispose of each Publisher File once the Qualified Student requiring said File completes the course or is no longer enrolled at the institution, whichever should occur first. I further agree to dispose promptly and securely of any Alternative Text at such time as the Authorized User is no longer authorized to operate under the jurisdiction of a college or university system.

These three terms exemplify the problem. The first prohibits a school from sharing a copy with another school – even another ATN member – unless the publisher gives explicit permission each time. Similarly, a school in possession of a file from a publisher must make a new request from that publisher each time the school needs to distribute it to a different student. If three students with learning disabilities are in the same class, the DRS

staff must make three separate requests. The third term requires 'secure archiving' or disposal of alternative text files after the qualified student leaves the university. Users of ATN report that they must retain copies of files, as some publishers refuse to send the same file a second time if needed for a subsequent student. However, each institution is responsible for its own definition of secure archiving.

In essence, only the publishers obtain the economies of scale from ATN. This quickens the speed of delivery to the school (a very important feature), but, beyond that, each school is required to work independently and any sharing requires subsequent approvals.

An additional limitation of the ATN service includes that the ATN member must ensure that each student demonstrates 'that he or she has purchased a copy, or that a copy has been purchased for him or her, of the commercially available print version of the Alternative Text'. In other words, by requiring purchase of an inaccessible copy, the agreement eliminates all financial motivation for publishers to publish accessibly.

Obtaining the electronic file (usually a PDF) is simply the first step. DRS staff frequently must further manipulate, enhance, and convert the PDF, depending on the sophistication of the file formatting and the specific needs of the requesting student. Some files are only image files of a printed page while others retain formatting information and other features of use to students. As a whole, ATN is one of the greatest resources available to colleges and universities for requesting and receiving digital files from publishers. However, the design of its membership agreement also makes it one of the greatest barriers to the efficient delivery of accessible content.

## Learning Ally

Learning Ally is a non-profit organization that provides educational assistance to people who are blind, vision impaired, and dyslexic. For students in post-secondary institutions and for adult learners, an annual membership fee provides access to over 80,000 audio-books as well as other tools.

In the college setting, the size of the collection is not broad enough to meet the majority of student needs. Learning Ally is not designed for institutional membership.

## Bookshare

The technology non-profit Benetech is the creator and sponsor of the Bookshare service, which is a source of accessible texts for individuals who register for individual accounts. Bookshare has focused important attention on supporting the K-12 educational environment (i.e. aged 6–18 years), but has increasingly expanded. Bookshare is developing strong ties with publishers to have them voluntarily deposit content and metadata directly. Benetech then converts and posts the content in multiple formats that can be used in multiple reader programmes. Membership is free for US students and modest for other individuals; all members must submit qualifying documentation of their disability(ies).

Benetech recently announced that it had reached 10 million downloads of the Bookshare corpus, and has launched a sophisticated evaluation process for certifying materials as accessible ([www.benetech.org/2016/09/20/benetech-delivers-10-million-accessible-ebooks](http://www.benetech.org/2016/09/20/benetech-delivers-10-million-accessible-ebooks)).

As we can see, there are several venues that provide important resources to students. What proves frustrating is that each one valiantly attempts to improve the environment and educational opportunities for people with disabilities, and yet, in our electronic age, some of the most basic capabilities to assist students are thwarted.

## PUBLISHER BEHAVIOUR AND PRACTICE

Publishers are under no obligation to provide accessible content to students. In the USA, if a student finds that materials are not accessible, the legislation holds the school liable, not the content provider. This is the current legal reality. The Americans with Disabilities Act ([www.ada.gov](http://www.ada.gov)) and other relevant statutes such as Section 504 of the Rehabilitation Act of 1973 do not apply to published books, film, or textbooks. The office building where an editor works must be physically accessible by building code, but the products they make do not have to be. Rather, the educational institution is responsible for creating reasonable accommodations and ensuring students with disabilities are able to obtain the information as fully, equally and independently as a person without a disability.

It is necessary, therefore, to describe the common practices of some publishers, and provide suggestions for how they can help in the provision of accessible materials.

When a school requests a digital copy of a book for the purposes of accessibility, they need a book that has the following minimum characteristics:

- All text is machine readable and has been proofread for accuracy.
- The organization of the text is represented through markup or a style sheet. For example, headers are marked as headers, rather than simply bold text or large font size.
- Images have at least a descriptive caption (and a full alt-text caption is the ideal).
- Tables are inserted as spreadsheets, not as images.

Ideally, campus accessibility staff would like to get their source files from the publisher, and they often begin by requesting that. If ATN has the title, the school will likely get a good-quality machine-readable PDF. If the publisher is not one of the 17 that cooperate with ATN, the results of direct appeals are often unrewarding, especially at 4-year colleges where there is less use of textbooks and more instructor-selected readings. But even if the request is for a textbook, the response may be too slow to meet a currently enrolled student's needs.

If and when a publisher does respond, they will often send page images rather than machine-readable text. For accurate OCR, especially OCR of mathematics, software may require image resolutions as high as 600 dpi. Publishers often provide 150 dpi, which means that campus accessibility staff have to scan from the printed book to get an image that will produce OCR of reasonable quality. Once they have that, the machine-readable text may well go back into a Word or RTF file – something approximating what the author probably submitted to the publisher in the first place. If publishers do provide machine-readable PDFs, they come in under the publisher's file-naming conventions, and not necessarily divided by chapter, so the material is not ready for distribution.

In recent years, ebooks have been gaining in popularity in academic library collections and for course adoption. Ebooks might seem to obviate the problems described above. The recently released EPUB 3 standard offers publishers a much improved format in which to create accessible ebooks, but adoption is still in progress and the format by itself does not guarantee accessibility. At present, ebooks are not yet a uniform solution to the basic accessibility problem.

Micropublishing and supplementary online materials present their own accessibility issues. Increasingly, the first challenge faced by campus accessibility professionals is determining the exact title, edition, and extent of an assigned reading. Publishers of textbooks often create custom compilations with individual ISBNs, a practice which decreases the likelihood of finding the right item when trying to associate a title with an ISBN, or use a known ISBN to search. A version of the same problem occurs when new editions are created by the alteration of a small amount of content, or by changes that only affect online supplementary materials. Faculty regularly require the latest edition, whereupon accessibility staff will start the process of requesting permission anew, even if they have in hand a version which already contains what is actually needed.

Supplementary online materials present their own, often unsolvable, accessibility issues. These are the online quizzes, study guides, three-dimensional models, animations, short videos, and interactive material that are stored remotely, accessed by individual student license code (with no institutional license offered), and unavailable for remediation, through the publisher or otherwise. Even were they are available to accessibility staff, these online materials come in some of the most irremediable information formats. Unfortunately, some (like online quizzes or study guides) may be critical.

The cumulative effect of these practices creates specific burdens for students with disabilities and the school DRS staff attempting to support them.

## RECOMMENDATIONS

Publishers, especially textbook and academic publishers, have the ability to make a significant difference for students with disabilities, and need to keep in mind that this represents

more than 10% of the student market, and growing (Cortiella & Horowitz, 2014). That being the case, we offer the following recommendations to academic and scholarly publishers.

A formative step that publishers can take – even without changing their current practices – is to publicly recognize the obligation that HEIs have to provide accessible versions of materials to students with disabilities. A statement by a publisher acknowledging this work by HEIs would calm fears at institutions that publishers may take legal action in response to the appropriate conversion of copyrighted material for a qualifying student with a disability.

Publishers should familiarize themselves with the BISG guide to accessible publishing (BISG, 2016), implement its recommendations, and make accessibility another core factor of the publishing process. Publications that are accessible, especially in the academic market, ensure that the full customer base can actually use the product.

The majority of publishers already require authors to submit manuscripts in digital form according to a style guide. Publishers prepare digital pre-press files, so they should make the most accessible of these file formats available. The currently common practice of providing schools with 'fixed' or even 'locked' PDFs is counterproductive. In many cases, schools must create manipulable and formatted files in order to meet student needs.

Publisher members of ATN should change the membership agreement terms, particularly the parts that require schools to request permission for each time a text is needed or used and that they cannot share it with other HEIs. Specify instead that schools are expected to retain a copy of the file and may continue to reuse it for other students with qualifying disabilities and may share with other HEIs for authorized students with qualifying disabilities.

Publishers need to make online supplementary materials accessible, or at the very least provide source files to campus accessibility staff and allow them to make them accessible where possible.

Micropublishing should be recognized as inherently unfriendly to accessibility. Making accessible versions of new sections, apart from the whole, readily available for users with demonstrated need could alleviate this problem.

## AUTHOR NOTE

This article is adapted from the white paper 'Libraries: Take AIM!: Accessible instructional material and higher education' written by the author and several colleagues (Wood *et al.*, 2017). The white paper was part of the project 'Repository services for accessible course content'. It has been edited and shortened for the audience of this publication and used with permission. The complete paper is available online at The Tufts Digital Library.

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