

## Association for Information Systems AIS Electronic Library (AISeL)

---

SAIS 2015 Proceedings

Southern (SAIS)

---

2015

# Leveraging Learning Management System to Accommodate Students with Disabilities: Issues and Experiences with the Canvas LMS

Mark Pendergast

Florida Gulf Coast University, [mpenderg@fgcu.edu](mailto:mpenderg@fgcu.edu)

Follow this and additional works at: <http://aisel.aisnet.org/sais2015>

---

### Recommended Citation

Pendergast, Mark, "Leveraging Learning Management System to Accommodate Students with Disabilities: Issues and Experiences with the Canvas LMS" (2015). *SAIS 2015 Proceedings*. 36.

<http://aisel.aisnet.org/sais2015/36>

This material is brought to you by the Southern (SAIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in SAIS 2015 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# Leveraging Learning Management System to Accommodate Students with Disabilities: Issues and Experiences with the Canvas LMS

**Mark O. Pendergast**

Lutgert College of Business  
Florida Gulf Coast University  
mpenderg@fgcu.edu

## **ABSTRACT**

Creating an accessible learning environment in virtual and traditional courses supported by learning management system software (LMS) can be a daunting task. University courses and the policies created to support students with disabilities are subject to a multitude of laws. These include the Family Educational Rights and Privacy Act, Health Insurance Portability and Accountability Act, Americans with Disabilities Act, and sections 504 and 508 of the Rehabilitation Act of 1973. This paper will briefly detail the relevant laws, and then explain how features of the Canvas LMS can be used to meet satisfy these laws. Experiences and suggestions for improvement are also provided.

## **Keywords**

LMS, Learning management system, Massive Open Online Course, MOOC, disabilities, ADA, IDEA, Section 508.

## **INTRODUCTION**

From our university's Office of Adaptive Services website:

*It is the right of the individual to obtain services and accommodations so that he or she will have equal opportunity and access to succeed academically as his or her peers. It is also the right of the individual to expect these services and accommodations to be respectful and that his or her learning differences are seen as differences and not as a cause for loss of integrity and self-esteem.*

The rights of students are dictated primarily by the Americans with Disabilities Act (ADA) and sections 504 and 508 of the Rehabilitation Act of 1973. Yu (2003) asserts that the concept of accessible design is becoming an important aspect of web design, however, the lack of awareness of the laws and the need to make web pages accessible have created barriers to fully implementing the intent of these laws. In general, American universities have an office dedicated to creating policies and ensuring that students receive proper accommodations for their disabilities, but it is up to the student to ask for accommodations and to complain when they do not receive them. Faculty members may or may not be aware of the myriad of rules that can come into play when they post class notes on the web or use a learning management system to support their course. This paper will briefly detail the relevant laws, and then explain how the Canvas LMS can be used to meet laws requirements.

## **APPLICABLE LAWS**

A University's and therefore a faculty member's responsibility to accommodate students with disabilities are dictated by several laws, each of which apply to different situations and are often open to interpretation. Most Universities will have a set policy created by their legal department to help guide faculty members.

### Family Educational Rights and Privacy ACT (FERPA)

FERPA protects the privacy rights of student education records (U.S. DOE 2014). For students under 18, parents are granted rights to the records, if a student is over 18; rights are transferred to the student. One caveat in the rule is “These rights transfer to the student when he or she reached the age of 18 or attends a school beyond the high school level”. Therefore all students enrolled at a university, even those under the age of 18 (perhaps dual enrollment high school students) must give written permission for their educational records to be shared. This law comes into play when granting parents, tutors, and other mentors access to student records and graded assignments.

### Health Insurance Portability and Accountability Act of 1996 (HIPAA)

HIPPA protects the privacy of individually identifiable health information (U.S. HHS 2014). This law limits what medical information a faculty member or mentor can be given about a student with disabilities. In order to protect student’s privacy most universities will not disclose the exact nature of the disability, instead, a list of appropriate learning accommodations will be given to the faculty member. A student is free to share disability information, but a faculty member should not ask for it.

### Individuals with Disabilities Education Act (IDEA), Americans with Disabilities Act (ADA), Section 504, Section 508

The IDEA stands for The Individuals with Disabilities Education Act. The IDEA is a federal law that governs early intervention, special education and related services for disabled schoolchildren ages 3-21 (or until high school graduation) (University of Chicago, 2015). The ADA is a federal civil rights law designed to provide equal opportunity for qualified individuals with disabilities, including students. Section 504 of the Rehabilitation Act of 1973 is a law that protects individuals from discrimination based on their disability in connection with any public or private program or activity receiving federal financial assistance. Section 508 of the Rehabilitation Act of 1973 is a law that requires that electronic and information technology that is developed by or purchased by the Federal Agencies be accessible by people with disabilities (Thatcher, 2011). Some key points of these laws include:

- The purpose of the IDEA is to ensure that students are successful in the K-12 system whereas the ADA and Section 504 only ensure access, **because success in college is up to the student.**
- In K through 12 the school is responsible for identifying students with disabilities, testing those students, and providing services.
- At the post-secondary level, the student must locate the office that provides services for students with disabilities, register with that office, request accommodations, and provide documentation to support the need for accommodations.
- At the post-secondary level, the student must, once approved, request an accommodation in each instance that it is needed. Colleges are not responsible for knowing a student’s schedule and arranging accommodations without some form of initiation from the student.
- The 1998 version of section 508 created binding, enforceable standards that are incorporated into the federal procurement process. Section 508 does not directly apply to private sector web sites or to public sites which are not U.S. Federal agency sites (Thatcher, 2011). Therefore universities generally do not have to comply with the standards. However, the standards can be used by a university to assess whether the technology they employ is accessible. A list of standards can be found at (U.S. Access Board 2001).

### COMMON ACCOMMODATIONS

Each university has their own policies and procedures to help students with disabilities. This help usually takes the form of accommodation requests being sent to the faculty member so that they can provide extra services that the student may need. Some common accommodations include:

- Audio books
- Books in alternate format
- Adaptive technologies
- Instruction in study strategies
- Note takers
- Tape recording of lectures
- Tutoring
- No penalty for absences
- Minimal distraction testing environment
- Readers for tests

- Sign Language Interpreters
- Oral Instructions
- Extended time on tests

Some of these accommodations are outside the realm of an LMS. Audio Books and Books in alternate formats would be outside the scope of an LMS. A good learning management system can provide support for the other accommodations and should be compatible with other technologies commonly used by disabled students. The following paragraphs describe how Canvas supports these accommodations and suggestions for improvement.

### **Adaptive Technologies**

This would cover any technology made available to the student with a disability. Screen magnifiers, screen readers, speech to text, and braille readers. Many of these technologies are available free of charge, some (such as screen magnifiers) are included in operating systems; others would need to be purchased by the student. It is the faculty member's responsibility to ensure course content is compatible to the technology being used and provide accessibility standards dictated by law (Lazar, Hochheiser 2013). Canvas does provide a faculty guide for improving accessibility to your course (Canvas Guides, 2014). Special care needs to be taken by faculty members when creating custom note pages in html. Even with the use of adaptive technologies improperly created pages can be difficult or impossible to read for those with sight limitations. The Web Accessibility Initiative (WAI) at W3C.org has created a number of guidelines (W3C.org 2014). Some common rules include:

1. Use San Serif fonts that promote readability, e.g. Arial, Calibri, Tahoma
2. Use colors with care, 8% of the men have some degree of color blindness with red/green the most common
3. Make sure to have good contrast between text and background
4. Always use detailed "ALT" tags when inserting images
5. Use informative hyperlink phrases
6. Avoid the use of tables to achieve page layout
7. Be sure to use the "LABEL" tag when creating forms.
8. Support keyboard only input.

A good practice is to check your html using one of the many accessibility tools. W3.org provides a list of these at <http://www.w3.org/WAI/ER/tools/>. 508 Checker (Formstack, 2014), AChecker (Inclusive Design Research Centre, 2009), and Wave (WebAIM.org, 2014) are all easy to use, you go to their website, enter the URL of the page you want to test, and it will generate a list of errors and suggestions. In addition to accessibility, all html pages should be checked for validity. Validity checkers will find missing tags, broken links, obsolete tags, and other errors that might make it harder for screen readers to work correctly. An example of such a checker can be found at <http://validator.w3.org/>.

### **Sign Language Interpreters**

Deaf students require help with audio content of courses. As most of the content of an online course is textual in nature sign language interpreters are not generally necessary. However, audio recordings and multimedia presentations should have a closed captioning option. Speech to text software is readily available to help with this. The faculty member needs to review and correct errors in content created by speech to text software. This is especially true for any technical material. Current software is only 90 to 95 percent, likely resulting in at least one error in every sentence (Kenrick, 2014).

### **Oral Instructions**

Each exam and assignment in an LMS should have an accompanying page of text to describe the requirements of the assignment. So long as these pages are compatible with common screen readers, then this accommodation can be met. However, it is up to the faculty member to write accurate, unambiguous, and detailed instructions.

### **Tape Recording of Lectures**

For traditional courses this meant the disabled student was permitted to bring a tape recorder to class to record the audio portion of the lecture. For large lecture halls the professor would often be required to wear a microphone to enable clear recordings. Many LMS systems allow faculty to insert recorded media into their course material. In Canvas the editor that allows a faculty member to create note pages also allows recording with a web cam or in microphone only mode. At the

beginning of the lecture a page is created and recording started with a few clicks. This material would then be available to all students. Screen capture technologies, such as Camtasia and Jing, allow audio and computer screen videos to be made. Server and networks capabilities may limit the number and length of these recordings.

### **Tutoring**

For traditional classes supported by an LMS tutoring can be accomplished in the normal manner whereby tutors are assigned to students and they meet outside of class for help with assignments and studying for exams. For virtual classes tutors and students may never have the chance to meet face-to-face. Their interaction can still be supported by technology through shared editing sites such as Google Docs, EtherPad, and Microsoft Office Live (Carta, 2009). An LMS can assist the tutoring process by giving tutors access to assignment specifications, due dates, rubrics, and grading scales. Under certain circumstances the tutors could be given access to their mentee's graded assignments, subject to FERPA regulations (U.S. DOE 2014). Canvas supports an "Observer" role that can be used to support mentoring. Observers can be either "linked" or unlinked. All observers can read assignments, announcements, course documents and pages, participate in conferences, check the calendar, and see lists of quizzes. Observers cannot submit any assignments or quizzes, read quiz content, see grades (unless linked to a student), send messages to students, or join course groups. An observer can be linked to a student in which case the observer can see the student's grades and course interactions. The observer role in Canvas allows a tutor to keep up with what a student is doing in a course and what is expected of them. The "Conferences" feature of canvas utilizes the "BigBlueButton" conferencing software provided by BlinkSideNetworks.com. This conference system provides for audio, video, and text chat to attendees. Tutoring conference can be created in Canvas to allow the mentors and mentees to interact. Conference recordings are stored for 14 days, allowing the faculty member to observe the interaction and the student to review the tutoring session.

### **No penalty for absences**

This primarily affects LMS use to support traditional on campus courses. If a professor uses attendance as part of a grade then there must be a mechanism to disable it for students with disabilities. Canvas has a roll call attendance feature that allows attendance to be taken and calculated as another assignment in the grade book. A student attending 80% of the lectures would get 80% of the points allotted for the attendance grade. At this time there is no mechanism to exempt a student from the roll call grade. One work-around is for the professor to mark a student with a disability as always present, regardless of whether or not they actually attended class. This has the drawback of losing data about the student's ability to make it to class and what materials they may have missed if they were absent. A better mechanism would be to have a roster setting exempting the student from roll call grading (though their attendance would still be tracked). The question then becomes do you calculate the student's overall grade based on all the other assignments, or include the attendance assignment with a 100% calculation? An LMS could easily make this selectable by the faculty member.

### **Readers for tests**

For paper-based exams this means a person actually reading the questions to the student. For LMS this implies the ability to use commonly available screen readers for the exam. Most LMS systems, including Canvas, are designed to work well with screen readers. A good test for a faculty member would be to install a screen reader on their system and attempt a test blindfolded. ChromeVox (Google 2014) is a free add-on to Google's Chrome Browser. Faculty members are still required to construct test questions that work well with readers, this can be challenging for questions that reference diagrams, charts, or tables.

### **Minimal distraction testing environment**

In the past this has meant a clean, quiet, working space with no outside distractions. This is still true and can be accomplished with a university provided test center or in the case of a pure virtual course it would be the student's responsibility to find such a place. If this is not possible at home then a library or university study area would suffice. Modern distractions go beyond noise created by the environment to include noise and interruptions on the computer itself. Incoming emails, chats, Facebook updates, tweets, and other distractions not present ten years ago are now a common element in a student's environment. To help combat these temptations a lockdown browser such as Respondus can be required (Respondus, 2015). Respondus was originally designed to combat cheating on exams but it also has many features

that prevent outside computer distractions. These features include full screen displays that cannot be minimized, assessments cannot be exited until submitted, task switching is prevented, and browser menu and toolbar functions are disabled.

### **Extended time on tests**

This is a capability that all LMS systems will have. Experience has shown that there are several considerations that should be supported in order to give the students and the professor the best experience. The implementation of extended time should make it easy to add time for a given student, allow the professor to monitor how much time was actually spent, provide for stop/start/restart ability, and be scalable for large sections.

The LMS should make it relatively easy to give a student extra time on a timed assignment. The LMS we used prior to canvas was Angel. In this LMS it was necessary to create separate groups for students taking the standard amount of time and for those with extended time. Then for each assignment these groups could be given a different amount of time. Whenever paperwork for a student requiring an accommodation was received that student could then be added to the extended time group. Therefore it was not necessary to make a time change on an assignment by assignment basis. Canvas supports extended time on quizzes and exams by visiting the “moderation” page for the quiz. This page allows the professor to give students extra time on a student by student basis. The moderation page can also be used to give students extra attempts. The problem with this approach is that it is necessary to visit the moderation page of every timed assignment. If the accommodation paperwork for all students arrive at the same time, then one pass through the assignments is required. Late arriving paperwork requires student by student and assignment by assignment adjustments. For a class of 30 with 2 or 3 students needing an accommodation this is not a large burden, but for a large class with hundreds of students this can become quite a chore. A better method would be to control extra time through the class roster. Students could be designed to get time and a half or double time once, and then it would automatically be applied to all timed assignments. Potentially this grant of extra time could be done via the registration system with only a notification to the faculty member.

A second consideration is ensuring that students are given an adequate amount of time to compensate for their disability but not so much time as to give them an unfair advantage. Due to privacy laws professors only know that a student is entitled to an accommodation, but are not privy to the reason for that accommodation. As a general rule of thumb our university gives students time and a half on quizzes and exams. It has been my experience that this is adequate for most students; however, some do need more time. Unless the student comes forward to ask for more time the professor may not be aware of the problem. The LMS should provide feedback about how much time students take on exams. Canvas does this through the moderation page. There the amount of time taken by each student is shown to the minute, unless the time approaches an hour, at which point Canvas just states “finished in about 1 hour”. The professor is required to drill down for each student to see the exact amount of time taken. A better method would be to highlight students who ran out of time and in the case of students with an accommodation a notification should be sent to the faculty member. Again, with a small class it is not a large burden on the faculty member to visually scan the moderation pages, but for a large class or a MOOC, this may not be practical.

The LMS should provide students with the ability to pause/ resume an exam in case they need to take a break for medications or other physical needs. Some LMS provide this feature, others do not. In the case of Canvas, once the clock starts for an exam it cannot be stopped. The only recourse for the faculty member is to grant an exceptional amount of time on the exam. Another related feature is the ability for the faculty member to add time to an exam attempt that is already in progress or has timed out. Currently, the only recourse for a timed out exam is to allow an extra attempt. This forces the student to reenter all answers and essays. A better solution for student with a disability who has experienced a technical failure or needed medical attention would be to allow the professor to restart an existing exam attempt, with all responses preserved, and add an adequate amount of time for the student to finish.

### **EXPERIENCES and RECOMMENDATIONS**

Each term I have a half a dozen students who qualify for accommodations under the ADA. My introduction to information systems class will typically have 2 to 3 students requiring accommodations, or about 8% of the class. My advanced programming classes (with lower enrollment) will generally have 1 or 2 students comprising 5% of the class. Without a doubt, extra time on exams is the most requested accommodation. Both of the LMS systems I have used in my career,

Canvas and Angel, support extra time on quizzes and exams. Angel required the creation of separate student groups for varying amounts of time, Canvas required the time accommodate for each student be manually set for each student on each exam. Both methods are workable, but the Angel (group) approach is more scalable. Another common occurrence concerning extended time on exams is students who prefer to take their exam with the rest of the class, and thereby preserve their privacy. Once in a while these students over estimate their ability to complete on time, this leaves them rushing off to the testing center to complete the exam. Not ideal, but it was their choice. LMS systems should provide an exam “pause” feature to work around this and to handle medical needs that may interrupt an exam. Additionally, the LMS should provide faculty with alerts when students with accommodations do not complete on time. Tutors are the second most requested accommodation. Use of the Canvas “observer” role and “conferences” can assist tutor-student interaction.

Universities should provide resources to validate web pages created by faculty for courses to insure that they meet current HTML and accessibility standards. This paper identified several online tools that can be used to automate this process. Existing LMS systems, browsers, and accessibility tools have the ability to create an accessible environment providing that the faculty member perform due diligence when creating materials and handling accommodation requests.

## REFERENCES

1. Canvas Guides (2014) “Improving accessibility to your course”, retrieved from <http://guides.instructure.com/m/5834/1/92747-improving-the-accessibility-of-your-course>
2. Carta, D. (2009) “5 Ways to Collaborate on Documents Online in Real Time”, retrieved from <http://mashable.com/2009/02/21/online-document-collaboration/>
3. Google (2014) ChromeVox User Guide, retrieved from <http://www.chromevox.com/>
4. Formstack (2014) “See if your website is 508 Compliant”, retrieved from <http://www.508checker.com/>
5. Inclusive Design Research Centre (2009) *AChecker API*, retrieved from <http://achecker.ca/>
6. Kenrick, James, (2014) retrieved from “Speech recognition, the unreachable frontier”, <http://www.zdnet.com/article/speech-recognition-the-unreachable-frontier/>.
7. Lazar, J, Hochheiser, H. (2013) Legal aspects of interface accessibility in the U.S. *Commun. ACM* 56, 12 (December 2013), 74-80. DOI=10.1145/2500498 <http://doi.acm.org/10.1145/2500498>
8. Respondus (2015) “Respondus Lockdown Browser”, retrieved from <https://www.respondus.com/products/lockdown-browser/index.shtml>
9. Thatcher, J (2011) “Web Accessibility for Section 508”, retrieved from <http://jimthatcher.com/webcourse1.htm>
10. University of Chicago (2015) “IDEA, ADA, and Section 504”, retrieved from <https://disabilities.uchicago.edu/idea-ada-and-section-504>
11. U.S. Access Board (2014) “Web-based Intranet and Internet Information and Applications (1194.22)”, retrieved from <http://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-section-508-standards/guide-to-the-section-508-standards/web-based-intranet-and-internet-information-and-applications-1194-22>
12. U.S. Department of Education (2014) “Family Education Rights and Privacy Act (FERPA)”, retrieved from <http://www2.ed.gov/policy/gen/guid/fpco/ferpa/index.html>
13. U.S. Department of Health and Human Services (2014) “Health Information Privacy”, retrieved from <http://www.hhs.gov/ocr/privacy/>
14. W3C.org (2014), “Website Accessibility Initiative”, retrieved from <http://www.w3.org/standards/webdesign/accessibility>
15. WebAIM (2014) Web Accessibility Evaluation Tool, WAVE, retrieved from <http://webaim.org>
16. Yu, H. (2003) Web accessibility and the law: issues in implementation. In *Design and implementation of web-enabled teaching tools*, Mary Hricko (Ed.). IGI Publishing, Hershey, PA, USA 1-24.