Hot Topics: Accessibility in Higher Education

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Areas of Legal Concerns from Recent Lawsuits

- University wide definition of “Accessibility”
- Accessibility Audit and Strategy/Action Plan
- Policy
- Training and Education
- Procurement
- Websites
- Learning Management Systems (LMS)
- Classroom Technologies (podiums, display equipment, “clickers”, etc.)
- Banks and ATM’s
- Providing an Grievance Procedure
- Captioning
- Finally, my personal favorite, designating someone/department as responsibility and authority of accessibility

Unresolved Issues

- Authors Guild Litigation

  www.hathitrust.org/authors_guild_lawsuit_information

- E-Reader Accessibility Exemption Request

  www.disabilityscoop.com/2013/08/14/sony-amazon-accessibility/18514/Website Accessibility

- DOJ Web Accessibility Regulations

  lflegal.com/2011/07/web-delay/

- Section 508 refresh

  www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-ict-refresh

Current Legal Guidance

- DRA UC Berkeley Structured Settlement
  - www.dralegal.org/impact/cases/uc-berkeley-accommodations-initiative-structured-negotiations

Students who request course materials in alternative media can now expect to receive textbooks in 10 business days and course readers in 17 business days.

- OCR South Carolina Technical College Settlement
  - www2.ed.gov/about/offices/list/ocr/docs/investigations/11116002-a.doc

Web Developers designing Web content for all official Web pages must consider accessibility issues during initial development. For all new Web pages and revisions to currently used Web pages, Web Developers must follow the minimum standards.

- OCR Louisiana Technical College Settlement
  - www.ada.gov/louisiana-tech.htm

Things to Keep a Watch on

- TBR Accessibility Initiative

  www.tbr.edu/academics/accessibility-initiative

- Miami University Accessibility Lawsuit

  www.justice.gov/file/miami-u-complaint-intervention/download

- MIT – Harvard Litigation

  www.justice.gov/opa/pr/justice-department-moves-intervene-disability-discrimination-lawsuit-alleging-miami

Legal Resource Sites

- www2.ed.gov/about/offices/list/ocr/docs/investigations/index.html?exp=2#section504rev
- http://www.washington.edu/accessibility/requirements/legal-cases-by-issue/
- www.d.umn.edu/~lcarlson/atteam/lawsuits.html

Importance of the 3 P's

- Policy
  - Include Responsible and Authorized Accessibility Individual/Department
  - Define Accessibility
  - Provide access to additional documentation for Action Plan
  - Include required/recommended Training
- Procurement
  - Create accessibility review and testing along with contract language specific for accessibility
- Procedures
  - Grievance Procedure
  - Action Plan documents
  - Detailed training per unit

Breakdown of Academic Hot Topic Concerns

- Purchasing
  - Can we catch everything?
  - Is Open source good or bad?
- Learning Management Systems and Course Development (Overall Course Design)
  - Supplemental Material
  - Lecture Capture
    - CAPTIONING!
  - Document Accessibility
- STEAM Content
  - Why is Math so hard?
- BYOD

What are your Hot Topics?

- Taking 5 minutes to hear from the audience to help ensure the days pre-conference can try to hit on a little of everything!

Areas where Accessibility May Apply

- Obtaining information
  - E-Reserves
  - Databases
  - Audio and Video
  - Books (hard copy and electronic)

- Web-based material
  - Websites
  - Applications
  - Bibliography Software

- Procurement
  - Library has its own

Procurement

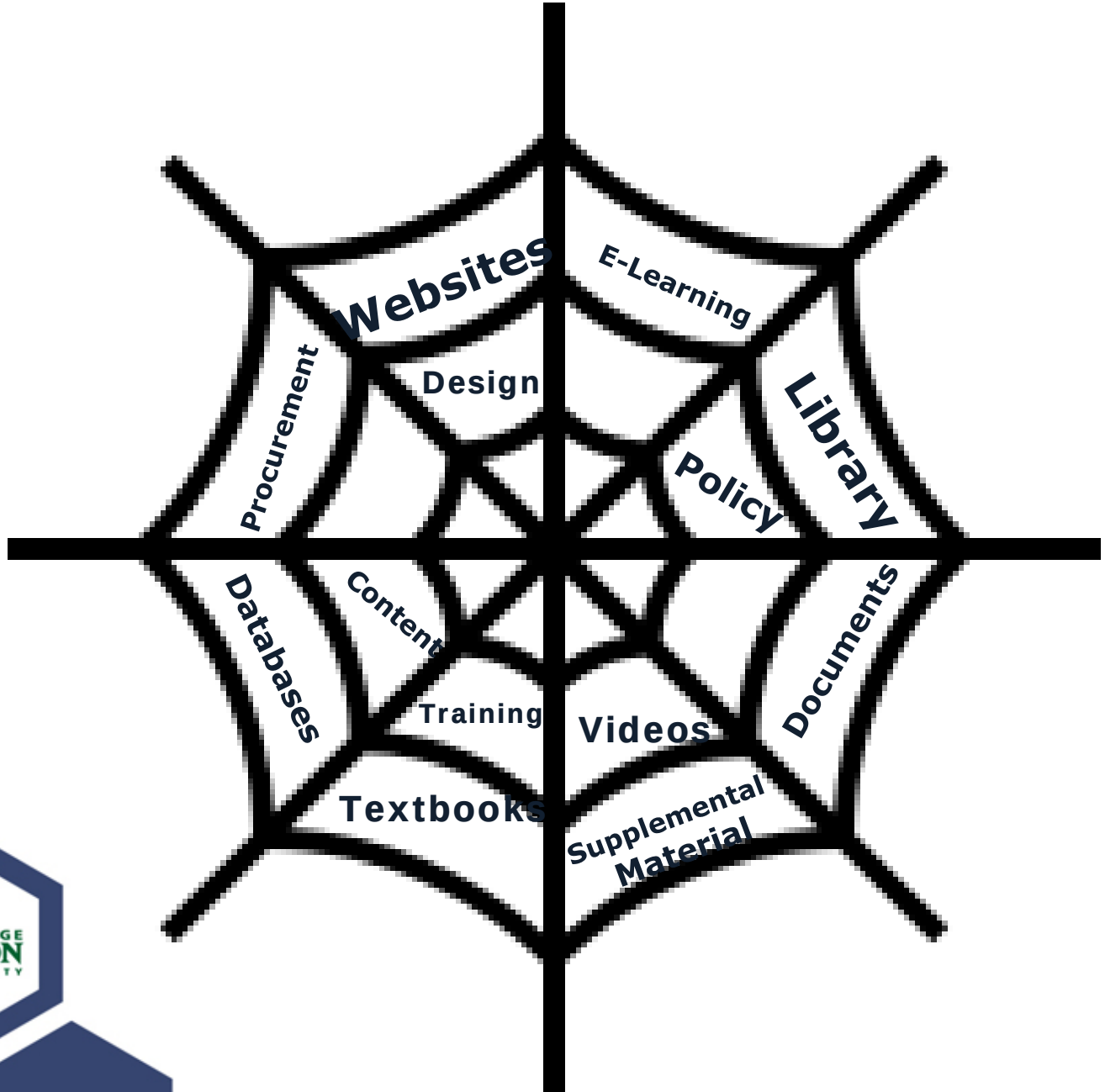
- Create a policy
- Build a working group
- Design a methodology
- Determine how to review
- Start your reviews

Setting Priorities

- New vs Old Purchases Procurement Policy in place helps draw a line for Legacy Systems.

- Institutions might wish to prioritize compliance initiatives targeting new websites and content with a commitment to improve access to existing and archived sites
  - This focuses on Websites, Documents, Videos, etc.
    - A number of resolution agreements target compliance in this manner

The Web of Accessibility



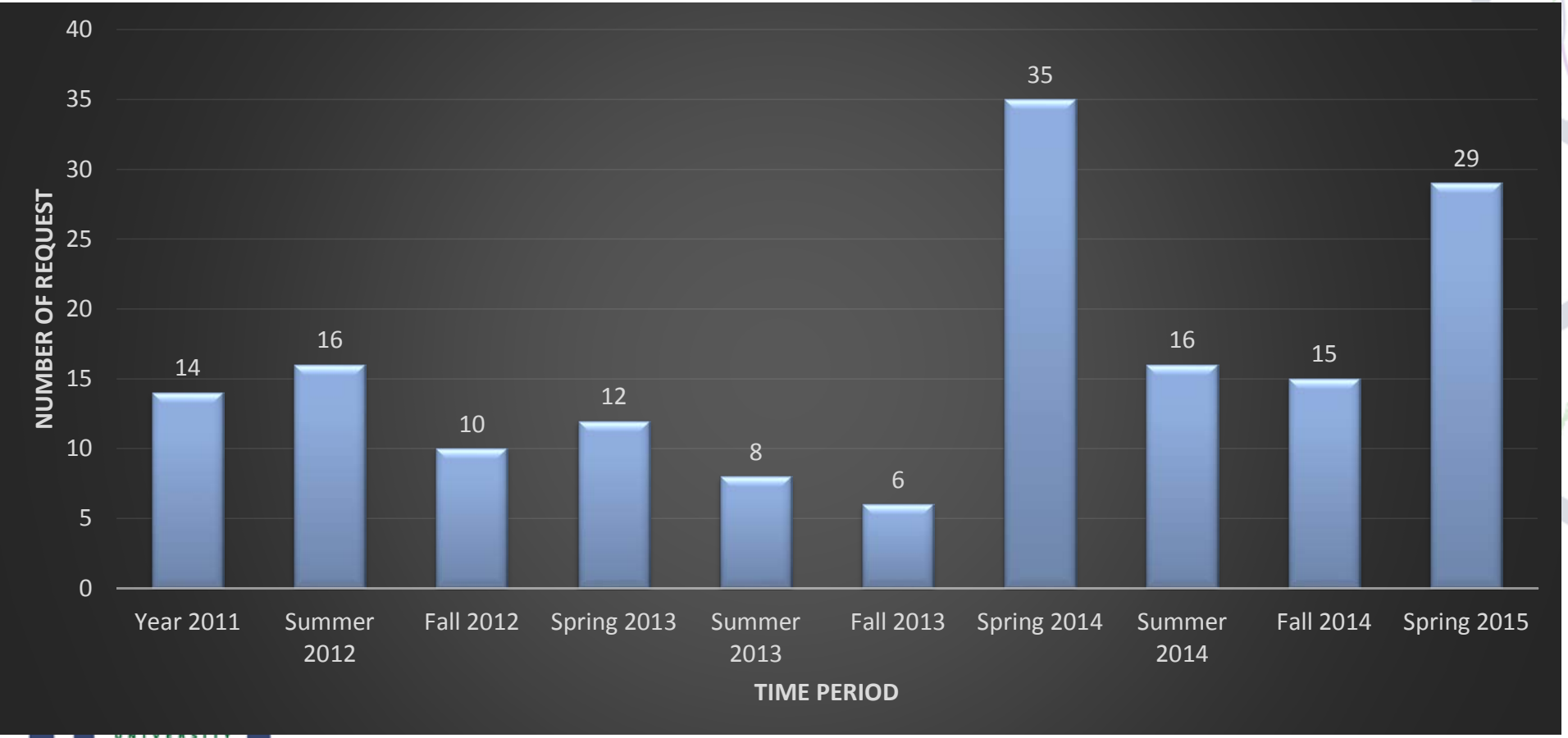
Accessibility Policy Included:

Mason is committed to maintaining a diverse and inclusive academic community, where all students are afforded the opportunity for a transformational learning experience. This commitment must and does include individuals with disabilities. Therefore, the ***procurement, development, maintenance, and/or implementation of electronic and information technology*** will conform to the accessibility standards specified in Section 508 of the Rehabilitation Act of 1973 and WCAG 2.0, appropriately tailored to the specific circumstances of the University. ***All colleges, schools, departments, auxiliaries, research, and administrative entities that do not comply with the standards herein are responsible for any costs associated with remediating accessibility issues.***

Procurement

- Mason created an Architecture Standards Committee in 2008.
  - The Architecture and Standards Committee (ASC) is responsible for reviewing, verifying compliance and providing recommendations with regards to new/upgrade software or hardware procurement projects.
  - The ASRB is under the Architecture Standards Committee (ASC) and is responsible only for approving the beginning of a given project. This initial review will include an accessibility review by ATI and any other reviews necessary. At the ASRB's discretion, changes in the architecture, design, security, accessibility, data access, or other elements can be required before approving a project.

ASRB Reviews from 2011 - today



E.g., Sample Accessibility Language

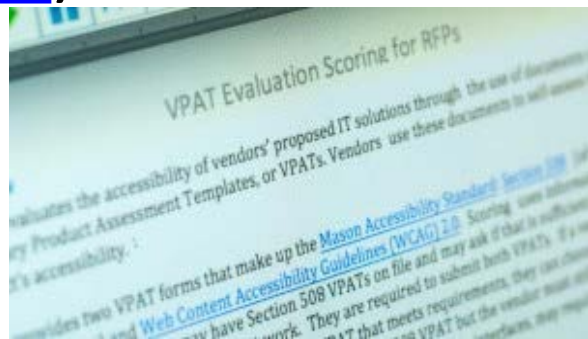
- **GMU's Sample Accessibility language (RFP's, contracts and contract addendums):**

All e-learning and information technology developed, purchased, upgraded or renewed by or for the use of George Mason University shall comply with all applicable University policies, Federal and State laws and regulations including but not limited to Section 508 of the Rehabilitation Act (29 U.S.C. 794d), the Information Technology Access Act, §§2.2-3500 through 2.2-3504 of the Code of Virginia, as amended, and all other regulations promulgated under Title II of The Americans with Disabilities Act which are applicable to all benefits, services, programs, and activities provided by or on behalf of the University. The Contractor shall also comply with the Web Content Accessibility Guidelines (WCAG) 2.0.

- **Is it necessary to be this specific??**
- Other accessibility language examples – NCDAE, University of California

Web Accessibility - Testing Websites and Applications

- Where do I start?
- Do you have an automated testing application?
- Do you have students you could ask to test?
- Do you have a testing process?
- Minimum – ask for a VPAT (Voluntary Product Accessibility Template)



E.g., VPAT

Sect. 508 standard

SECTION 1194.22 WEB-BASED INTERNET INFORMATION AND APPLICATIONS

Criteria	Supporting Features	Remarks and Explanations
(a) A text equivalent for every non-text element shall be provided (e.g., via alt, longdesc, or in element content).	Supports	The product is designed to provide text equivalence for all images, using the alt attribute.
(b) Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation	Supports with exceptions	The product does not provide embedded multimedia presentations. Users provide their own content, which may include multimedia presentations.

Alt-text for images (i.e., non-text elements)

Taken from http://udloncampus.cast.org/page/policy_template
Guidance documents: http://ati.gmu.edu/policy/vpats-voluntary-product-accessibility-templates/

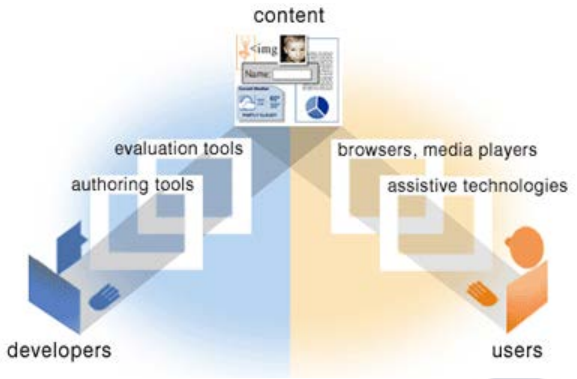
E.g., VPAT Matrix (GMU)

Hardware	Software (stand alone and web)	Websites	Developed components	Telecommunications	Other
Section 508 1194.25	Section 508 1194.21	Section 508 1194.21	Use WCAG 2.0 as checklist during development	Section 508 1194.23	Please contact ATI
Section 508 1194.26	Section 508 1194.22	Section 508 1194.22		VOIP? Please refer to Software	
Section 508 1194.31	Section 508 1194.31	Section 508 1194.31			
Section 508 1194.41	Section 508 1194.41	Section 508 1194.41			
	WCAG 2.0	WCAG 2.0	Use additional language – ATI must review prior to implementation		
	Videos included? If so, Section 508 1194.24	Videos included? If so, Section 508 1194.24			

Taken from: http://ati.gmu.edu/policy/vpats-voluntary-product-accessibility-templates/
Guidance documents: http://ati.gmu.edu/policy/vpats-voluntary-product-accessibility-templates/

Automated Testing Tools

- SSB Bart's AMP
- OzArt
- WAT Toolbar
- WAVE
- Chrome Color Contrast Analyzer
- Accessibility Evaluator for Firefox (Add on)
- N-WAX (NHN Web Accessibility eXtension for Firefox)



Manual Testing Tools

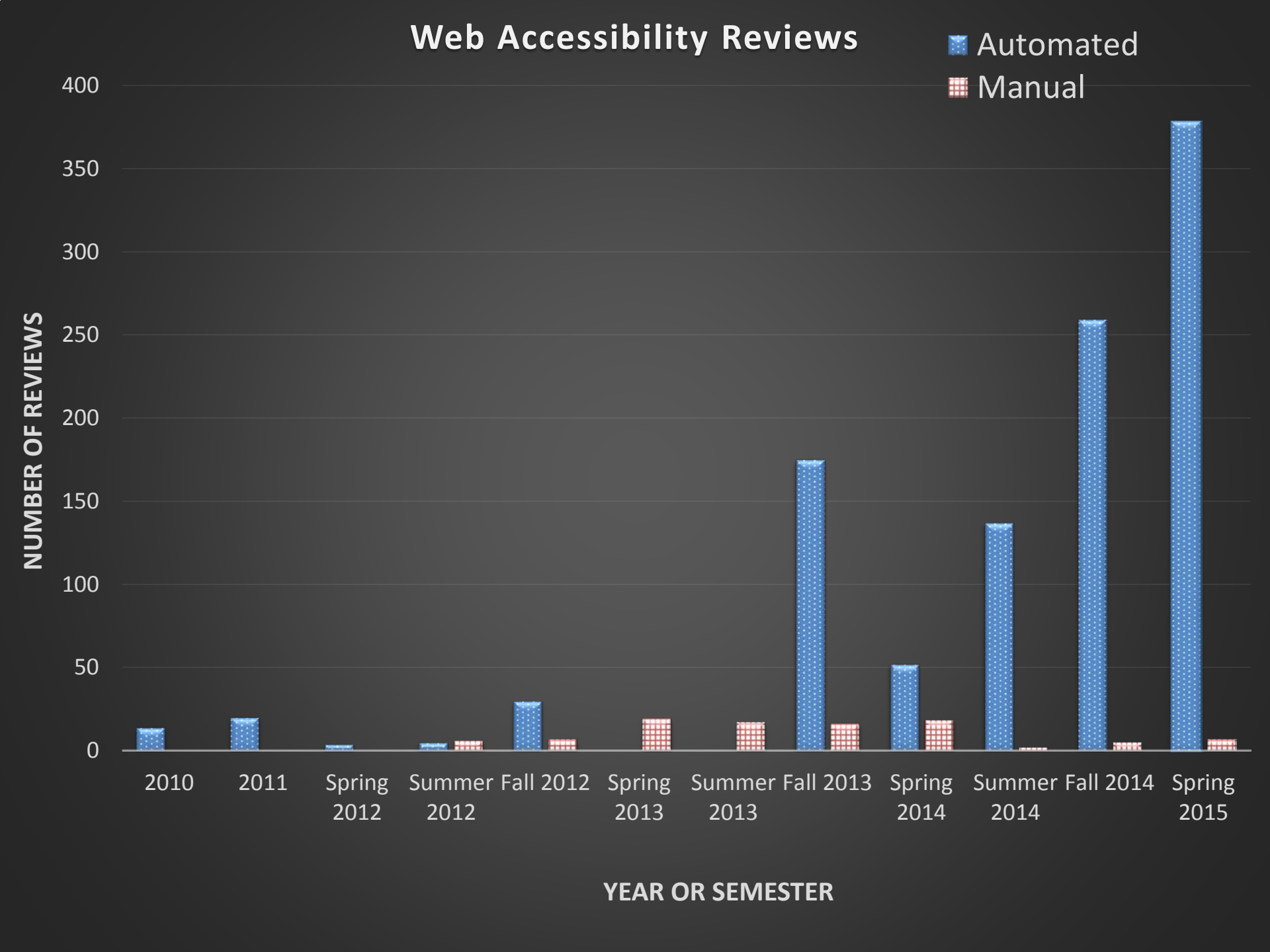
- Standard QWERTY keyboard
- JAWS
- NVDA
- Supplemental tools: VoiceOver (Mac/iOS); Dragon Naturally Speaking

- Browsers typically used: I.E., Firefox, Chrome
- Supplemental browsers: Safari

Manual Testing Checklist Items

- Keyboard Access
- Links and Link Titles (Example: “Click Here”)
- Skip Navigation Link or Mechanism to skip to main content
- Logical Headings
- Table Headings
- Alt Text for Images
- Form Fields & Labels (Error Messages on Forms)

- For a complete listing of errors we commonly see visit: ATI Web Accessibility – Roles and Responsibilities – Web Developers


Web Accessibility Reviews
Automated
Manual
NUMBER OF REVIEWS
400
350
300
250
200
150
100
50
0
2010
2011
Spring 2012
Summer 2012
Fall 2012
Spring 2013
Summer 2013
Fall 2013
Spring 2014
Summer 2014
Fall 2014
Spring 2015
YEAR OR SEMESTER

Procurement and Open Source

- How do you measure, catch everything when its free?
  - Is Open source bad if its harder to catch?

- Pros and Cons of Open Source Softare
  - We're all broke!

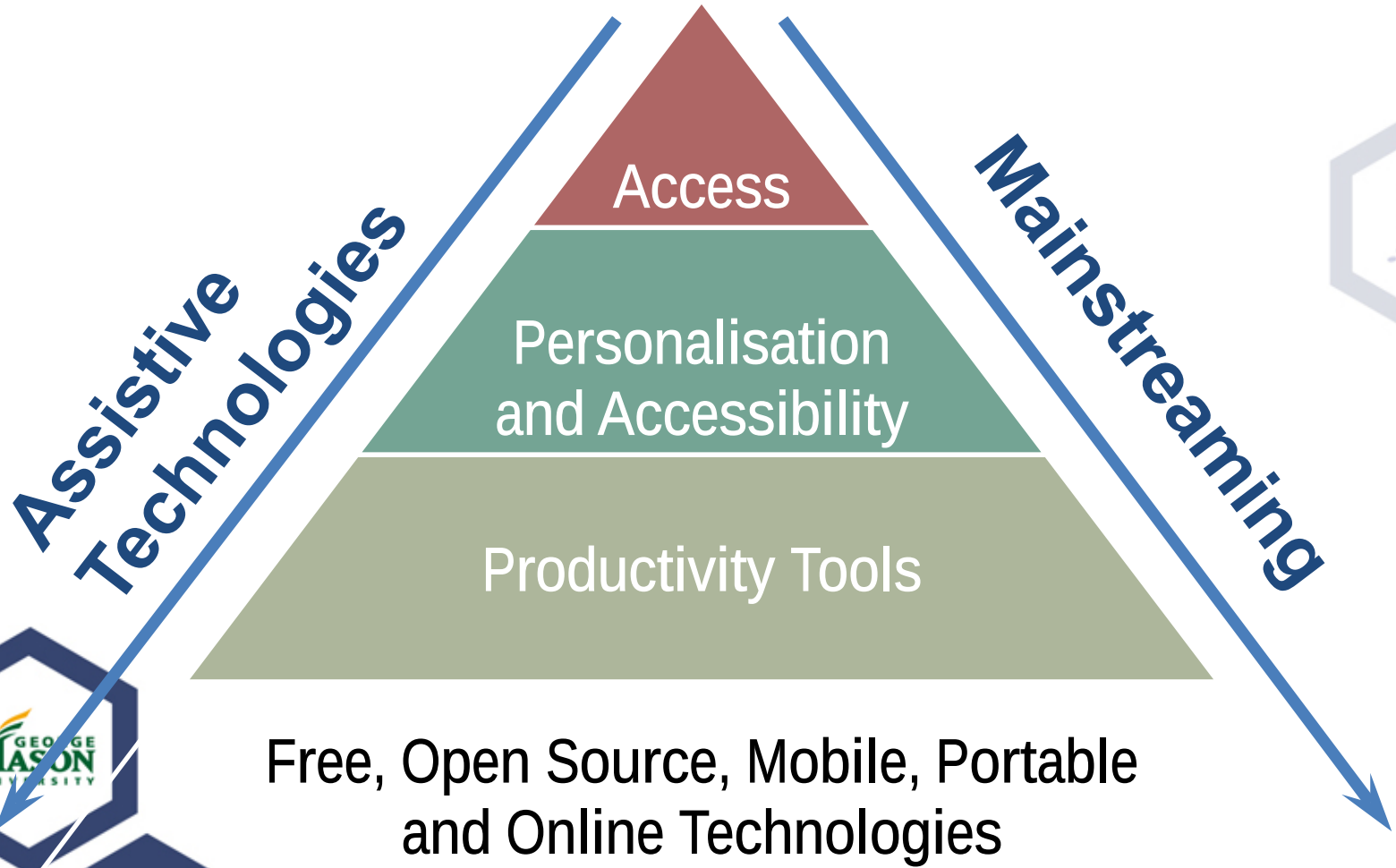
Free, Open Source and other licensing options?

Do we need to go free range?

Open Source Slide section compliments of Abi James & E.A. Draffan - WAIS, Electronics and Computer Science,University of

E-mail: a.james@soton.ac.uk
ead@ecs.soton.ac.uk
http://access.ecs.soton.ac.uk/

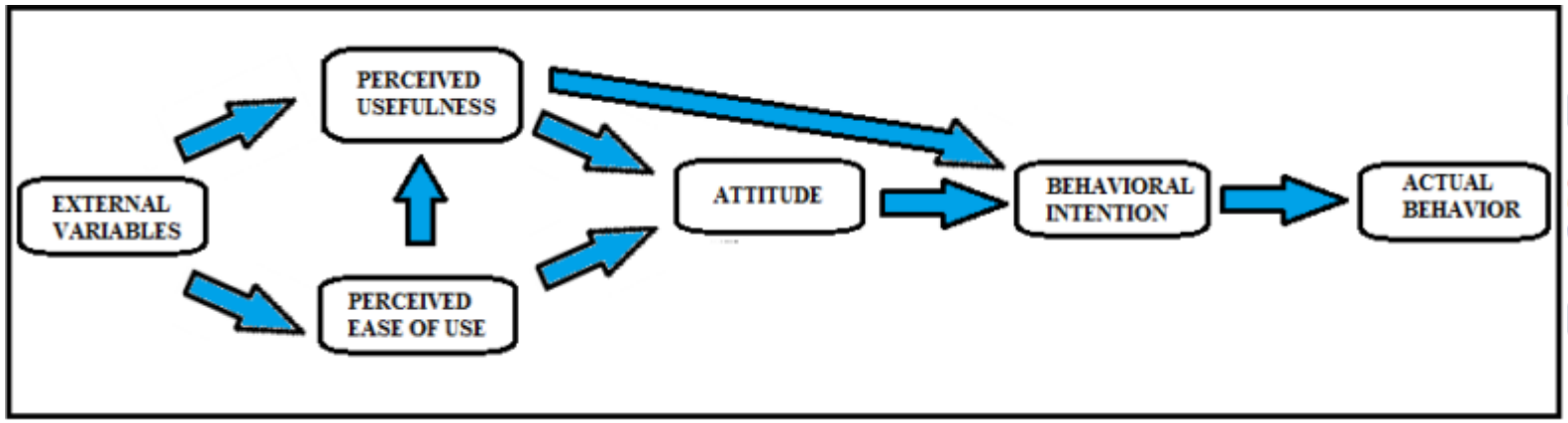
Many Facets of Assistive Technology



Assistive Technology licence selection!

- Open source
- Freeware / Shareware
- Integrated
- Freemium
  - Subscription
  - In-app purchase
- Commercial
  - Licence purchase – cost per seat / concurrent user / site…
- Support & maintenance, upgrades

But many factors impact on students' acceptance of Assistive Technology



- Technology Acceptance Model (TAM, proposed by Davies,1989)
- Wide variation in comments, but all focus on usefulness / ease of use

Barriers and Facilitators to Uptake of Assistive Technologies

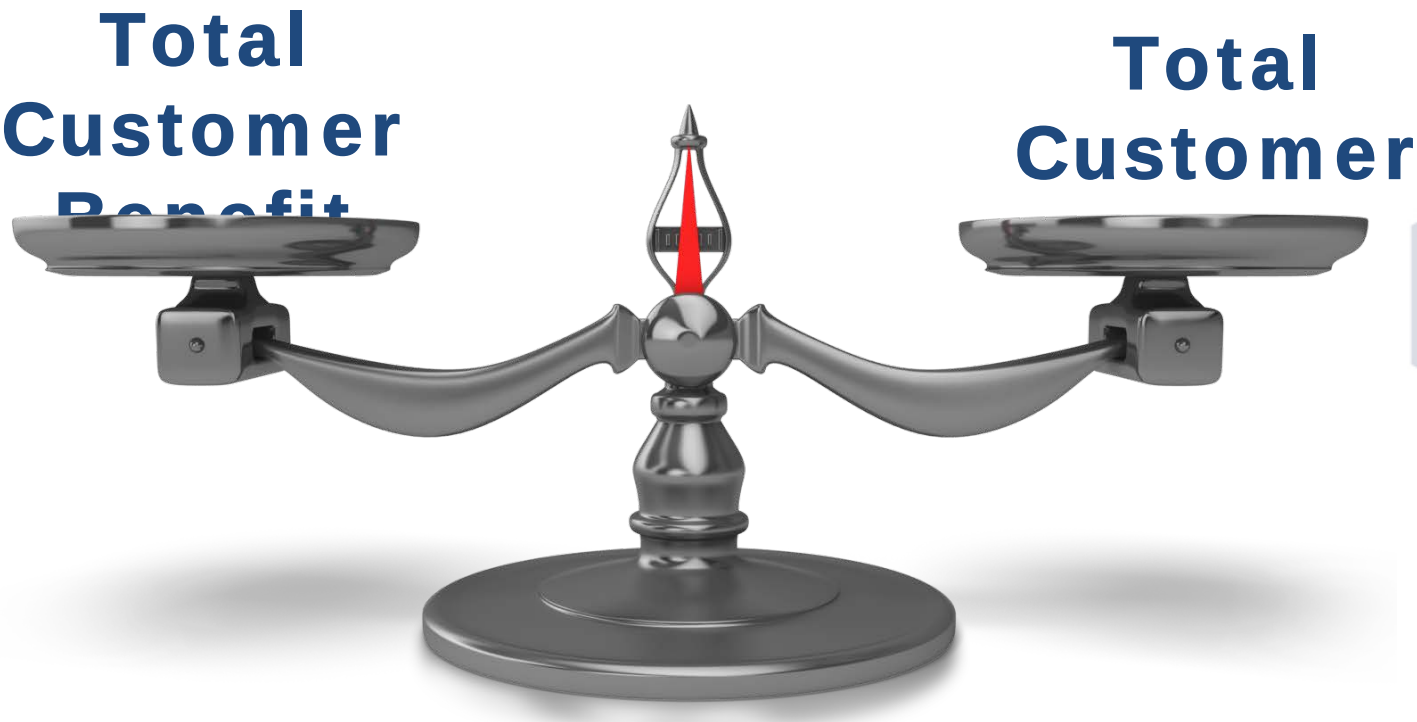
- PROVIDE TIMELY ACCESS
- IMPROVE AWARENESS
- IMPROVE FUNCTIONALITY & DESIGN
- INVOLVE USERS IN DEVELEOPMENT & USE
- REDUCE STIGMA
- PROVIDE TECHNICAL SUPPORT
- IMPROVE COMPETENCY & CONFIDENCE

=

- ENHANCED OUTCOMES?
- SMOOTHER TRANSITION BETWEEN PHASES OF LIFE?
- BETTER USE OF RESOURCES?
- BETTER EXPERIENCE FOR USERS & PROVIDERS?

Draffan et al (2015) Barriers and Facilitators to Uptake of Assistive Technologies: Summary of a Literature Exploration.

Customer perceived value



Advantages..

Free	Freemium & Integrated	Paid licenses
No cost	Supported tool	Supported tool
Easy to try out	On going development	On going development
Quick to access	No / low cost	Sophisticated features
Community support	Easy to try out	Warranty
Less “feature bulk”	Quick to access	Possibly the only solution
	Community support	
	Possibly less stigma attached	

But...

Free	Freemium & Integrated	Paid licenses
Little of no support or maintenance	Features can become premium	Cost and upgrades
Limited warranties	Larger user base required to sustain freemium business	Feature bloat
Liable to disappear	Integrated tools, often less training materials	
Not always suitable for the workplace		

Developers' perspective:

ATbar: open source browser toolbar.

- Marketplace allows for customisation & localisation

- Maintenance funded through projects

ATbar for Windows: open source desktop tool, providing simple feature set in competitive market

STEMReader: math TTS with freemium model

- Free add-in to ATbar, premium version to fund support & future development

LMS, Supplemental Material, Lecture Capture, Captioning and Document Accessibility

Learning Management Systems

- All have multiple partnerships with 3rd party companies, that you might not even be aware of. How do you determine what's accessible and what isn't vs what is owned by the LMS you have implemented?
- How do you get an LMS to work on accessibility?

Supplemental Material

- Those dreaded publishing companies
  - Pearson, contact Thurston, Jonathan jonathan.thurston@pearson.com
  - McGraw Hill, contact Nicks, Lisa Lisa.Nicks@mheducation.com
  - Cengage, contact – Accessibility Council, Cengage accessibility@cengage.com, I've also contacted, by suggestion, DeLeon, Kevin M kevin.deleon@cengage.com
  - Zybooks, contact Bert Yagrich bert.yagrich@zyante.com

They aren't all bad! There is hope -

Start working with the Publisher Reps

- Publisher Reps come to campus and talk with faculty to try and sell their product.

- Contact the faculty, departments and even the publishers to find out who your rep is and get on their schedule!

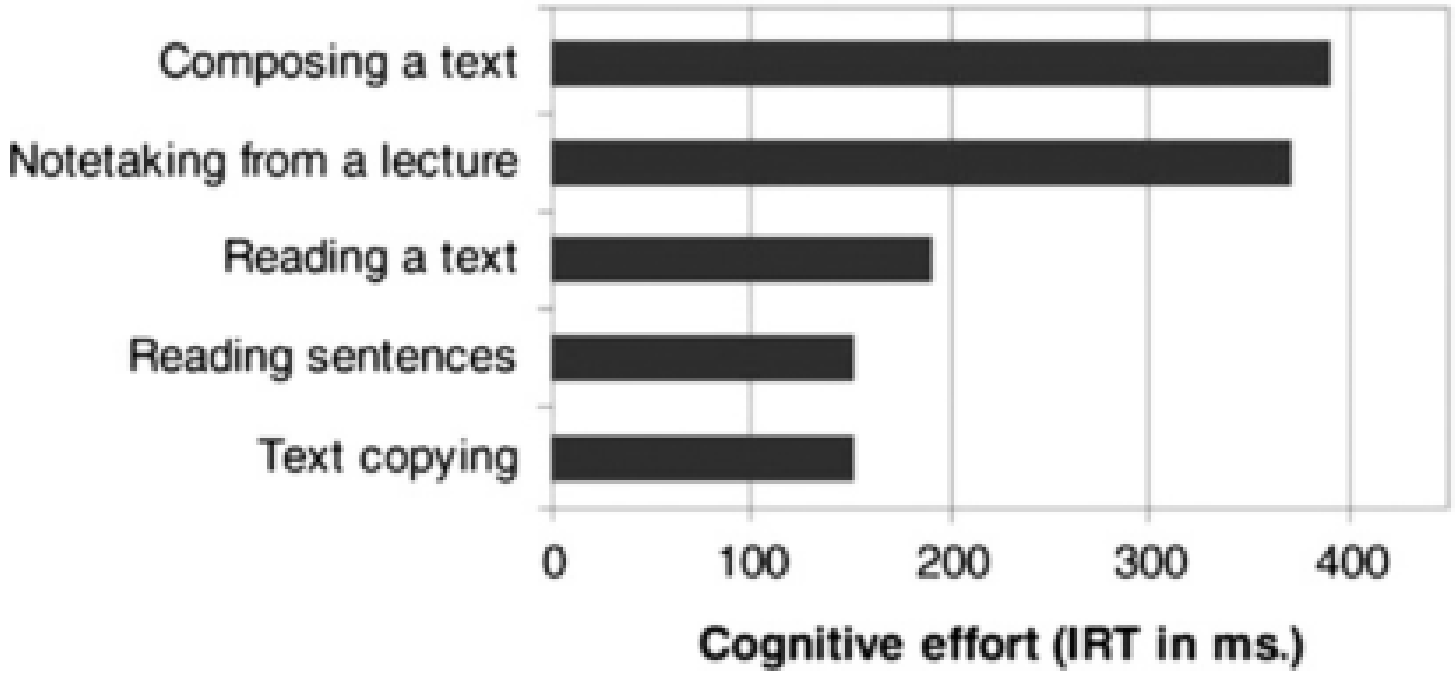
Are lecture capture systems accessible?

- This is a difficult conversation because many of us to need to use or automatically go with the cheapest, but cheapest may not be best!

Camtasia vs. Captivate vs. Articulate vs Kaltura vs …..

Sometime to Consider

Note-taking in a lecture is approximately 3 times as cognitively demanding as copying text.



Bui & Myerson (2014); adapted from Piolat et al. (2005)

Refreshment Break

Multimedia Accessibility

Audio and Video in all its variety

W3/WCAG Guidelines

- Transcript: probably required
- Audio Description: may be required
- Captions: probably required
- Timeliness: accessibility features need to be included at the time a multimedia item is published, not later.

- http://www.w3.org/TR/UNDERSTANDING-WCAG20/media-equiv.html

Pitfalls to avoid

- YouTube “Autocaptions” or other speech-recognition-based solutions (‘autocraptions’).
- Failing to include all relevant info (significant sounds besides speech, visuals, etc.)
- Failing to provide in a timely manner.
- Offering a non-equivalent alternative or non-equitable access.

Things to help with accessibility

- Keyword searching.
- Ability to browse topics.
- Intuitive interface.
- Content optimized (OCR)
- Quick information retrieval.
- Good indexing (Metadata)
- Provides better accessibility and use by all individuals regardless of AT

Creating Accessible Videos

- **What's involved in making videos accessible?**
  - Providing **captions for videos**, **transcripts for audio files**, **descriptive video (or audio description)** for individuals with visual impairments
  - Be practical!

- **Setting up a process...**
  - Consider 3rd party vendors, in-house staffing, or a combination of the two.
  - E.g., For audio description, ***Outsource*** (3rd-party vendor) vs. ***In-house*** (*YouDescribe*)

- **What platform will you use?**
  - Video platform is important! E.g., ***Free*** (YouTube, Vimeo) vs. ***Pai*** (Panopto, Kaltura)
  - Are video player controls keyboard accessible? Free of keyboard traps? All features available? Interface with LMS?

Creating Accessible Videos – Tips

- **What about automatic captioning tools?**
  - E.g. YouTube CAPTION FAIL – Jamaican Hoax Video, https://www.youtube.com/watch?v=23H8IdaS3tk
  - **Takeaway?** There is no cheap and easy fix!

Identify your Strategic Partnerships

Start with the obvious!

- How many students with hearing impairments do you have?
- Does your campus offer online courses?
- MOOCs?
- D/Hoh Services Coordinat

Who is on your campus…

- Disability Services (DS)
- Information Technology Un
  - Online Learning Services
  - Instructional Design Team (ID)
- University Libraries (UL)
- Distance Education (DE)

Things to consider…

Budget/Prioritization

- Where is the money coming from?
- Whose managing the service?

How are you staffing the service?

Infrastructure?

- Platform (e.g., Kaltura, Panopto, YouTube, etc.)
- Editing tools (e.g., MovieCaptioner, YouTube, DocSoft, etc.)

Develop policies and procedures

- Turnaround time for requests?
- How will people make requests? Who can make requests?
- How will you handle library resources?

Additional considerations

- **In-house (i.e., students, staff/faculty) vs. Outsourcing**
  - What model fits best at your institution?
  - Goals...Accommodation (Reactive) vs. Compliance (Proactive)?
  - What can you afford?
- **Training, Training, Training!!**

Outsourcing Considerations

Vendors Mason have used

- 3PlayMedia, Ceilo24, eScribeSolutions, DocSoft, Automatic Sync Technologies, CloudFactory (SpeakerText), Audio Description Associates (AD)

Tips when outsourcing:

- Ask about cheaper per minute costs for longer turnaround times.
- Bulk purchases = Reduced per minute rates
- Prioritize vendors that sync with institution's video management platform, if applicable
- Transcription alone is cheaper than transcription + synchronization

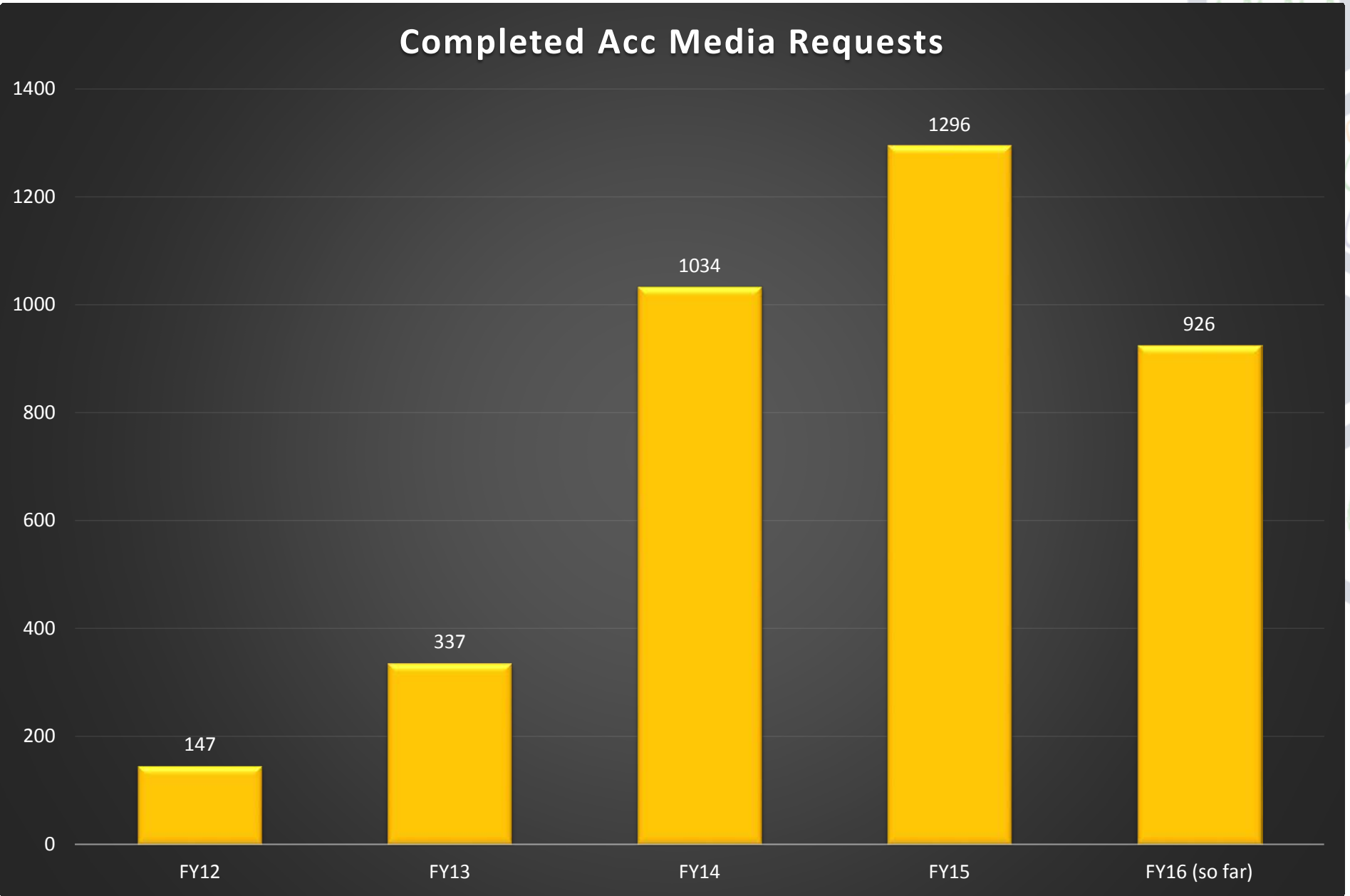
Vendor specific considerations

- Video Management Platform Integration
  - i.e. Kaltura, YouTube, Vimeo
  - Creating tags & tagging videos vs. direct integration
  - 3rd party tools i.e. Interactive Transcript Plugins
- Web Interface
  - Uploading videos
  - Downloading .srt and .txt
  - Cancelling jobs
- Language Options
- Customer Service
  - Billing
  - Bulk Purchases
  - Negotiate pricing based on delivery timelines
    - i.e. Compliance vs. immediate Disability Accommodation

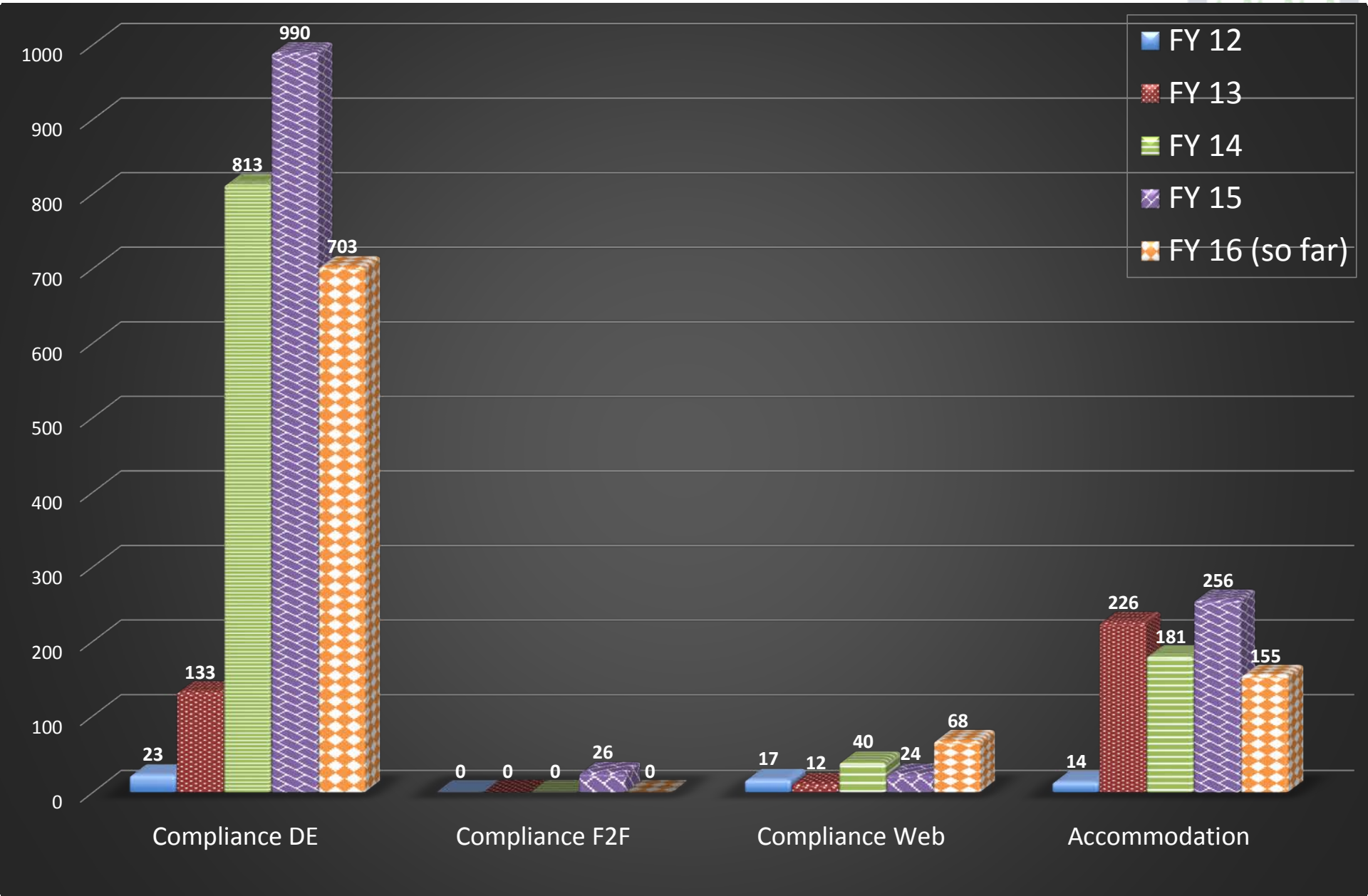
Cost Comparisons by FY

	FY12*	FY13	FY14	FY15	FY 16 (so far)
Total Minutes	3,453	7,309	16,419	19,261	15,633
Total Hours	57.55	121.82	278.4	321	261
Total Jobs	195	371	1034	1296	926
Hours (Outsourced)	18.63	68.97	222.55	275.95	249
Jobs (Outsourced)	24	177	901	1136	856
Avg. Cost/Min (Outsourced)	**$2.94**	**$2.73**	**$2.35**	**$1.88**	**$1.39**
Hours (In-house)*	38.92	52.85	51.1	45.05	2.68
Jobs (In-house)*	171	194	133	160	70
Total Costs (In-house)*	$13,707.62	$0	$0	$0	$0
Avg. Cost/Min (In-house)*	**$5.87**	$0	$0	$0	$0
Cost Savings (outsourcing)**	**($6,858.55)***	**$869.02**	**$5,074.14**	**$7,781.79**	**$7,320.60**

Completed Accessible Media Requests, FY12-



Compliance Breakdown vs. Accommodation



Managing Audio Description

1. Outsource
   - ***Very expensive*** – Can be as much as $2000 per video minute
   - ***Is it necessary??*** – Depends….few actual requests in 4-year period
2. In-house
   - ***YouDescribe*** - Audio Description Crowd-sourcing tool for YouTube videos: http://youdescribe.org
   - ***Examples:***
     - Kevin Hart/Jimmy Kimmel - http://youdescribe.ski.org/player.php?prefer_d=clairemahany&v=OPdbdjctx2I
     - MJ Thriller - http://youdescribe.ski.org/player.php?prefer_d=Laurae&v=sOnqjkJTMaA

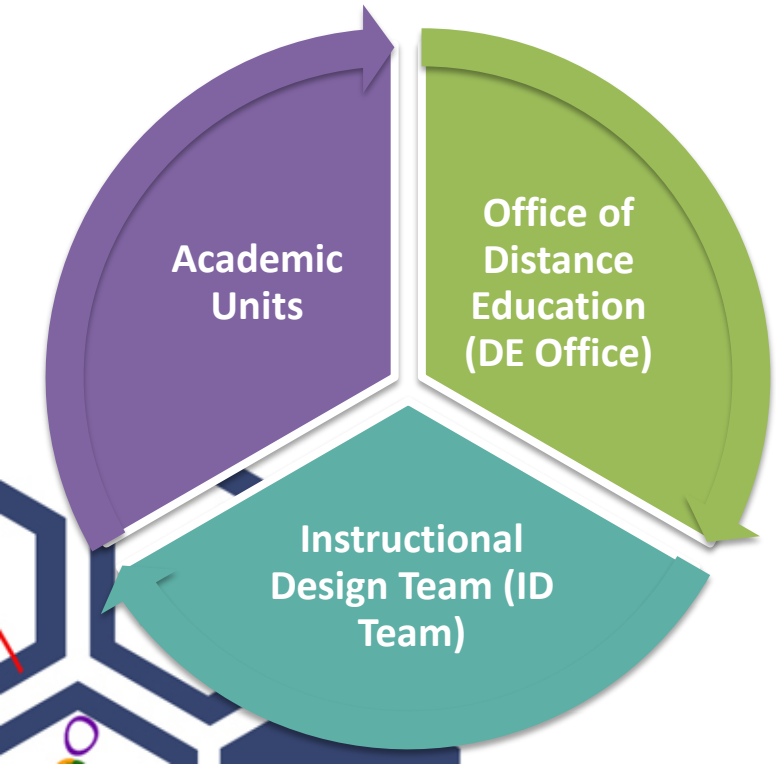
Managing Library Resources:
Library's Streaming Media Policy

- At the request of the ATI, **the library will create a streaming version of an media items that already incorporate open- or closed-captions**.
- **Access vs. Copyright** – The library will defer to the ATI's request for equivalent access to library resources.
- Library will seek the incorporation of captions, subtitles, etc. during **procurement process**.
- For titles already in library's collection, **library will reach out to vendor** to make their resources accessible.
- When requested to do so by the Assistive Technology Initiative or another unit, **the library will check its holdings for the presence of captions**. If existing library catalog records do not accurately reflect the availability of captions, the library will attempt to update these records.

Accessible Video Players

- Check to ensure the video players used on campus are accessible. Vimeo and YouTube aren't completely accessible!
- Kaltura states they have a 508 Player that the HTML5 player replaced.
- Accessible Video Players also help standardize a video player for the University!
  - Fully Accessible Video Players
    - JWPlayer
    - OzPlayer, AccessibilityOz

Document Accessibility and Course Design



- University has **increased number of online courses and programs** by **~20% per year over the past 3 years** (DE Director, Personal Communication, May 2015).

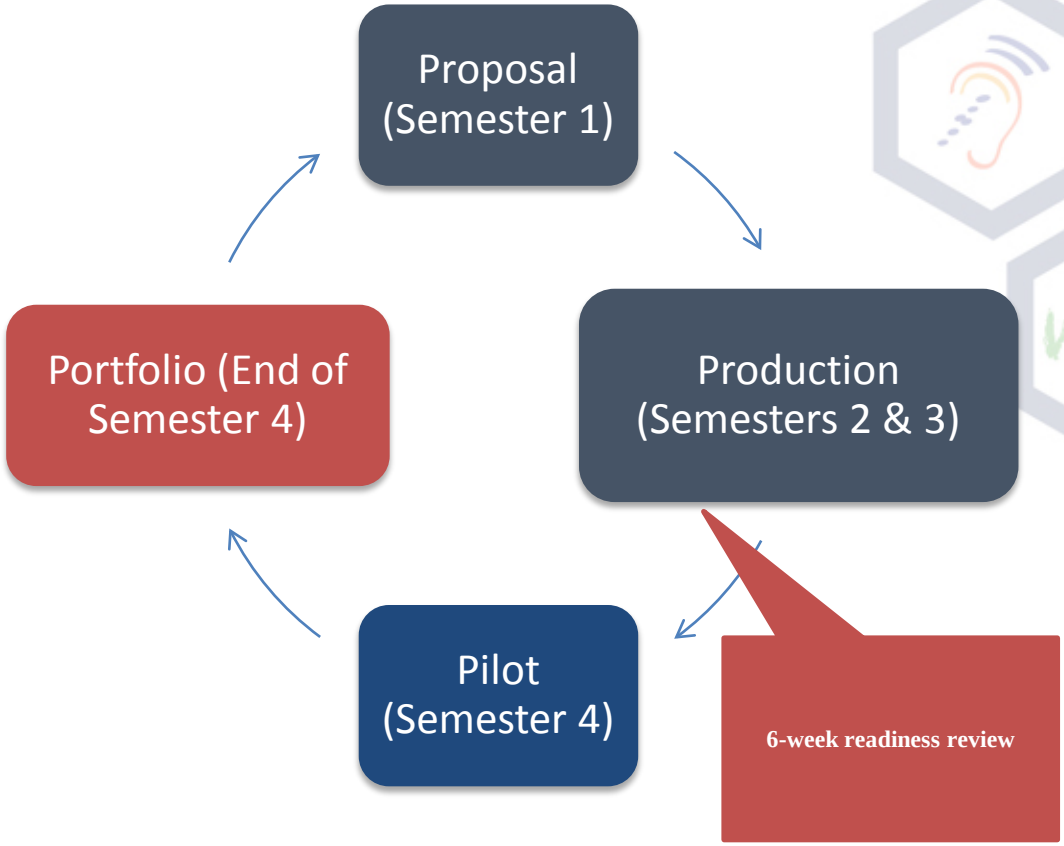
- *Key Offices:*
  - DE Office (Provost's Office)
  - ID Team (LSS/IT Office)
  - Academic Units (Colleges/Schools)

Work with Existing Online Course Development Models

- ***What do you have on campus?***
- ***4 "P"s*** – Proposal, Production, Pilot, and Portfolio (1-year)
- **OCDI** – Online Course Development Institute (6-week)
- Academic unit-specific Initiatives

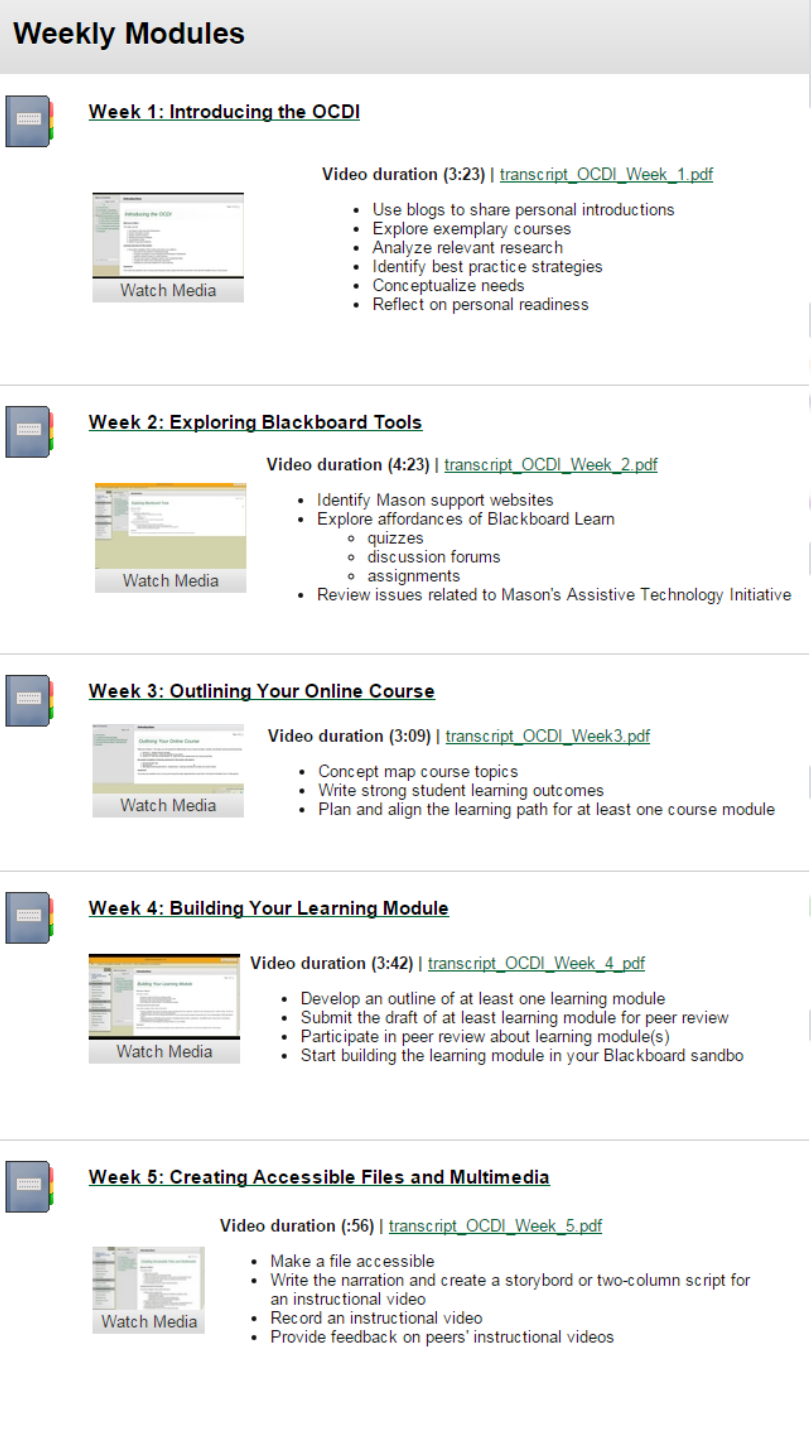
The 4P Process

- Largely driven by DE Office
- Each faculty member provided one-on-one ID support over course of academic year
- ***6-week Readiness Reviews***
- ***Course Portfolio Review Process*** after completion of pilot.
- End result is a **fully developed course**
- Slowly phasing out



OCDI

- Largely driven by LSS/ID Team
- Faculty/staff participate in a 6-week asynchronous cohort
- Viewed as a more scalable going forward.
- End result is **one fully developed module**.



Baseline Design Considerations for Online Courses

- **Visual:**
  - Provide alternative text descriptions for all meaningful graphics (images, charts, graphs, SmartArt, objects)
  - Provide descriptions for videos where visual content is important to understanding subject matter.
  - Use styles in Office documents, headers to mark-up tables or frames (for websites)
  - Choose applications that support keyboard navigation and are compatible with screen readers

- **Hearing:**
  - Provide captions for all videos
  - For audio, provide transcripts

- **Cognitive, Neurological:**
  - Use consistent navigation, tab order, appropriate language level

Sample – *ATI Course Accessibility Checklist*

Includes a review of the following areas:

1. Syllabus and Course Readings
2. Bb Learn
3. Word
4. PPT
5. PDF
6. Multimedia
7. Supplemental Applications

ATI Course Accessibility Checklist (Internal Use Only)

Updated 5/28/2015

The following checklist verifies that the instructional documents, audio, and video content used in Mason's distance education courses are in accordance with Section 508 and WCAG 2.0 Level AA accessibility guidelines. While not a comprehensive review of all the areas covered by these guidelines, this checklist does examine areas that would have the most significant impact on the ability of assistive technology users to independently access their instructional materials (e.g., alt text, keyboard navigation, captions, transcripts, etc.).

PLEASE NOTE: This is NOT a comprehensive review of the accessibility of the faculty member's course. The reviewers will examine snapshots (i.e., Course readings, LMS layout/structure, 2-3 documents of each type – i.e., Word/PDF/PPT, 2-3 videos, and supplemental applications) of the elements highlighted in the table below and provide feedback/guidance to the instructor on how to correct any accessibility issues that are identified.

UNDERSTANDING THE REVIEW PROCESS:

Reviewers examined selected examples of the elements highlighted in the attached checklist (i.e., course readings, LMS layout/structure, 2-3 documents of each type – i.e., Word/PDF/PPT, 2-3 videos, and supplemental applications) and provided feedback and resources for the instructor on how best to remediate any accessibility issues that were identified.

Tools used for testing accessibility:

- Website Accessibility Reviews – WAVE Toolbar
- MS Office Accessibility Reviews – Built-in MS Office Accessibility Checker

Term:
Professor:
Course Evaluated:
Reviewer:

0.0 – Syllabus and Textbooks/Course Readings (Required and Supplemental)				
ID	**Textbooks/Course Readings**	**Yes**	**No**	**N/A**
0.1	Is an electronic equivalent provided for all print reading materials?			
0.2	Do all web articles/readings have a PDF/Word version available?			
	Syllabus	**Yes**	**No**	**N/A**
0.3	Course syllabus includes disability statement?			
0.4	Instructor offers multiple formats/options for			

Sample – *ATI Course Evaluation Document*

Includes the following:

- Priority Recommendations and Resources
- Understanding the Review Process (i.e., testing tools used and process)
- Findings

ATI Course Accessibility Evaluation

As a part of the Office of Distance Education's *Open Call Course Portfolio Review* process, the instructional materials used in your course (i.e., documents, audio, video, websites, and web applications) were examined to determine if they are accessible and usable by Mason students, including those with disabilities, in accordance with University Policy 1308.

This is **not** a comprehensive evaluation of all the areas covered by this policy; rather this review focuses on those areas that have traditionally had the most significant impact on the ability of students with disabilities to independently access instructional materials (e.g., alternative text descriptions, keyboard navigation, captions, transcripts, etc.).

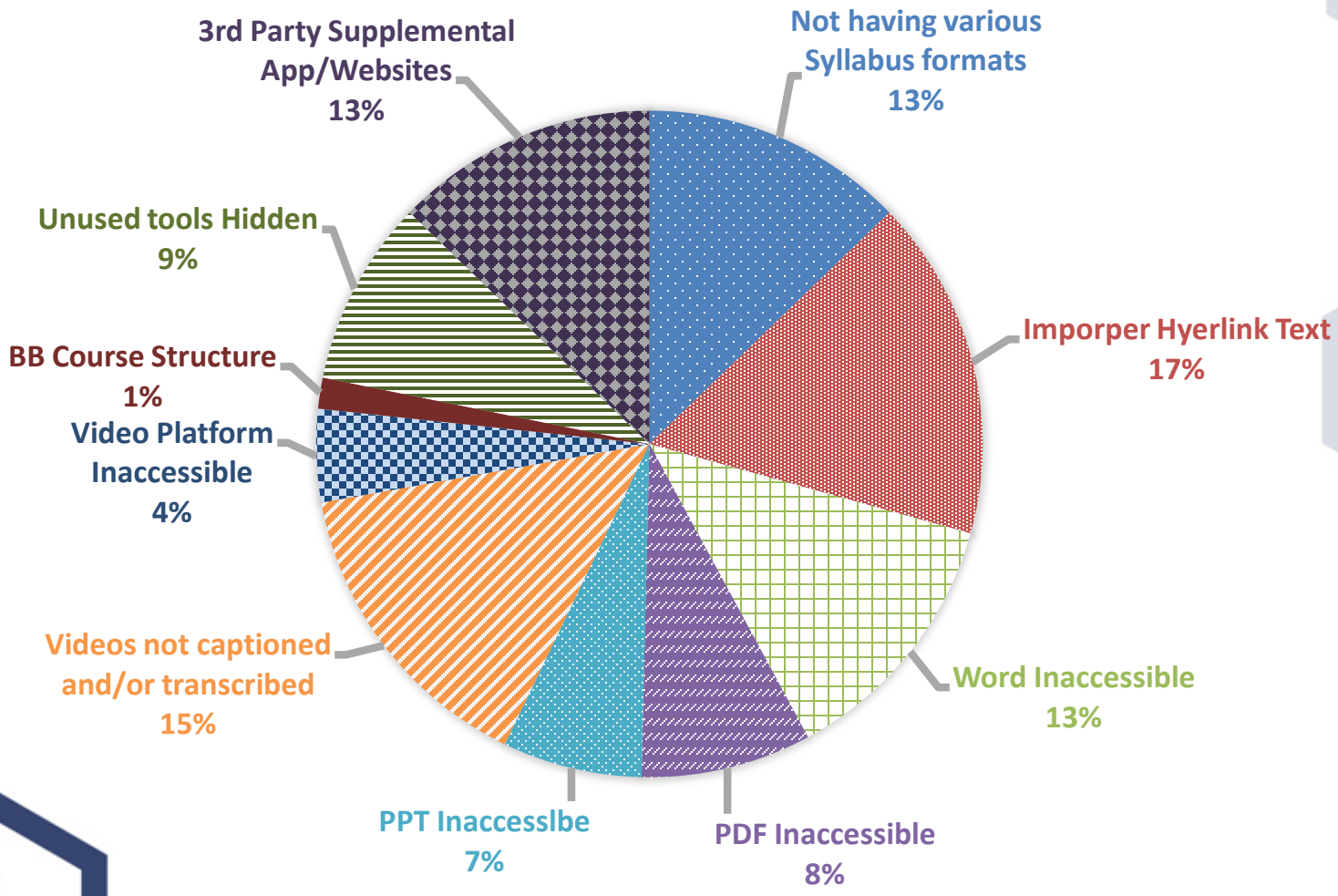
COURSE:

- **Term:** Spring 2015
- **Professor:**
- **Course Evaluated:**
- **Course Reviewer:**

PRIORITY RECOMMENDATIONS and RESOURCES:

Priority Issue	Action Plan
Ensure all course videos have synchronized captions and/or transcripts.	Go to the ATI's Accessible Media Request page for information on requesting this service.
Ensure all course videos are streamed through an accessible video playback platform (i.e., Kaltura, YouTube).	Upload course videos using the "***Kaltura My Media***" link in MyMason\Courses Tab. For assistance, contact the ATI Office and/or Learning Support Services.
Ensure that PowerPoint Presentations and Word Documents are accessible.	Visit ATI's Guide to Creating Accessible Electronic Materials (PDF – Section 2: Part II and Part III). Visit ATI Website: Creating Accessible Documents

DE Course Review Findings

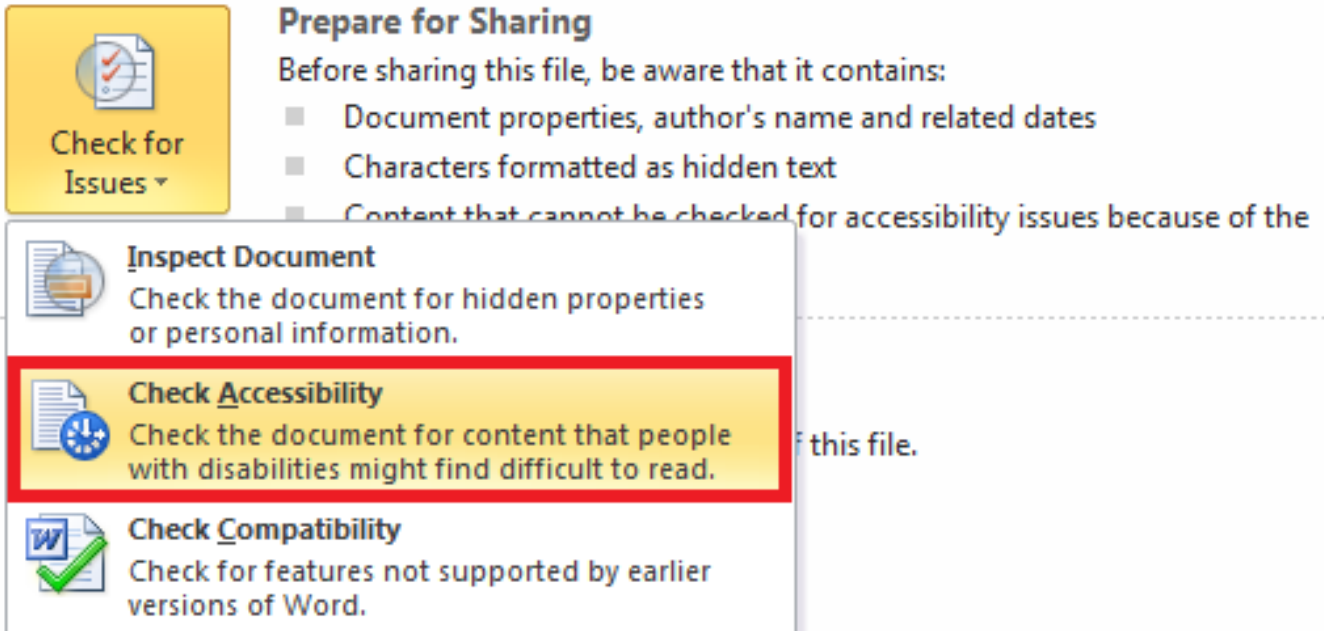


Where we are lacking

- Training on our services (FREE CAPTIONING) would take care of 15% of the issues.
- Training on Creating an Accessible Syllabus (covers multiple formats, proper hyperlinks and Word documents) would cover 43% of issues
- Working with faculty to educate about 3rd Party Supplemental material would cover 13%
- Total: 71% fixing of errors through Education and Awareness that can be implemented into other Office trainings

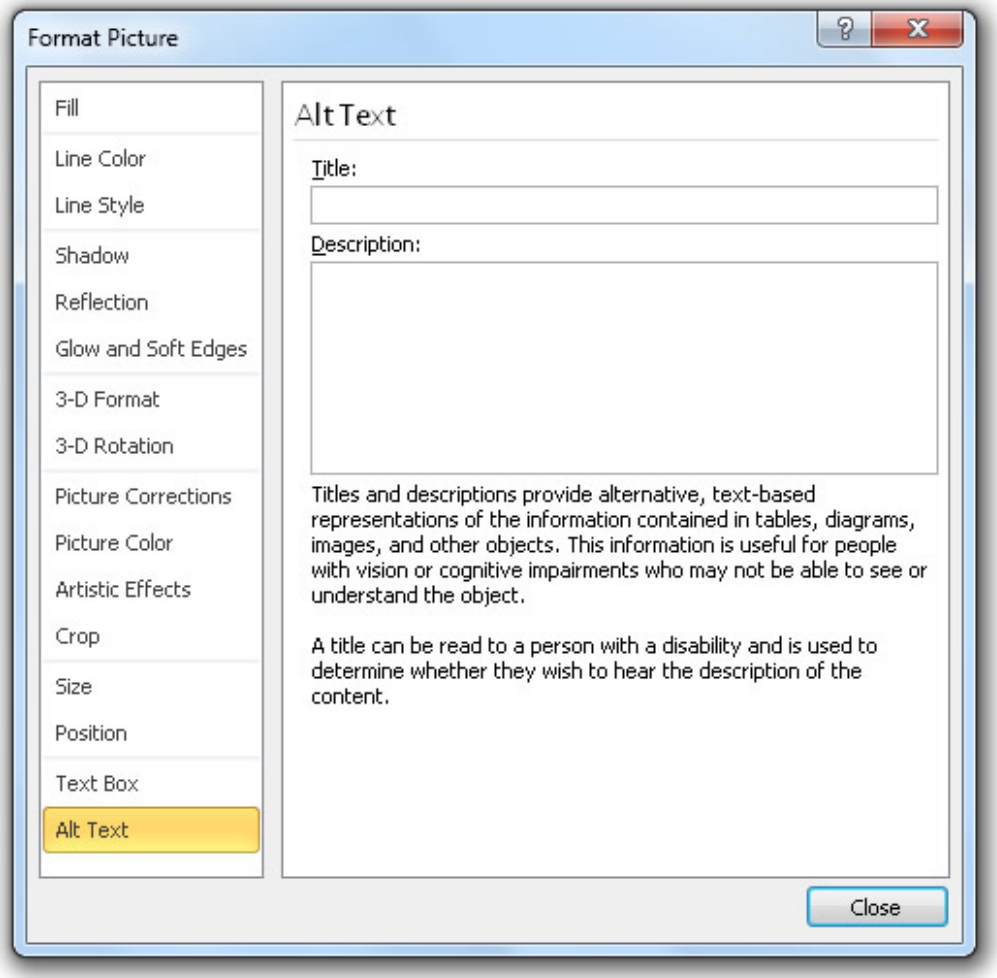
Microsoft Office 2010/2013 Built-In Accessibility Checker

File Menu, “Check for Issues,” and then “Check Accessibility”



http://www.microsoft.com/enable/training/office2010/default.aspx

Adding alt text in Word

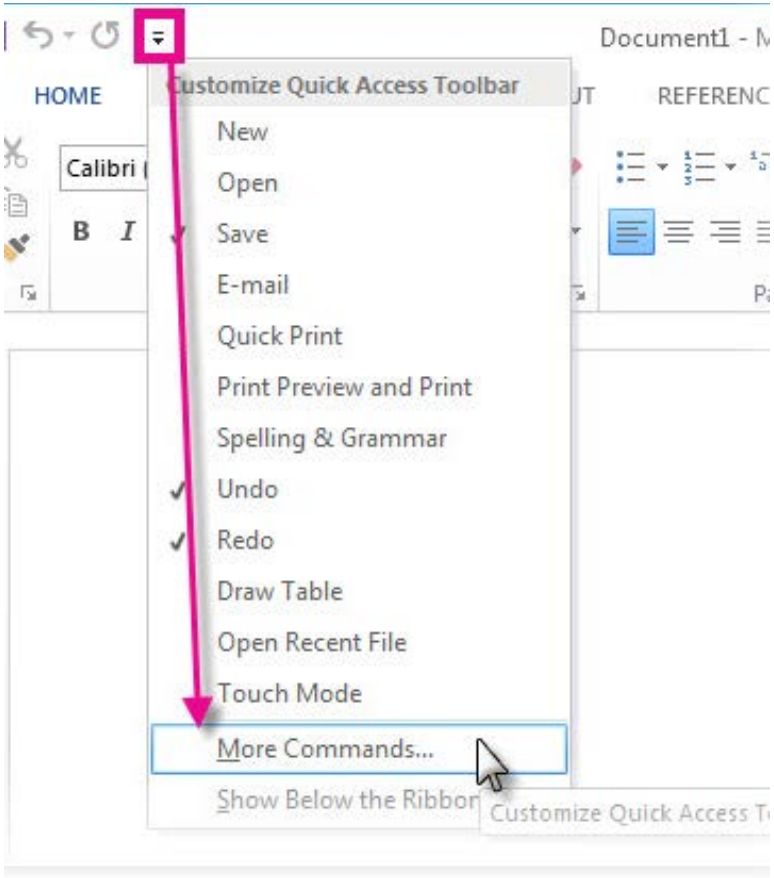


Making Alt Text Readily Available

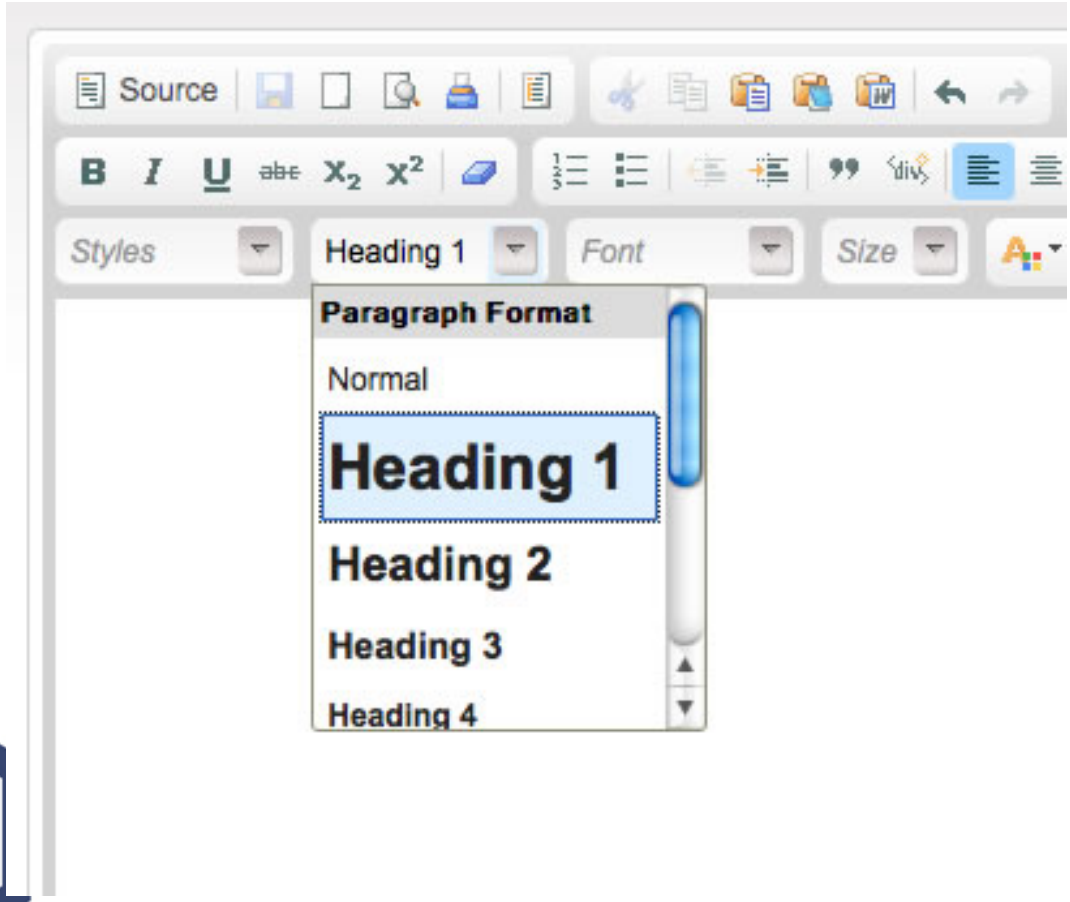
Using the Quick Access Toolbar (Windows Only):

1. In the upper-left corner above the Ribbon, click **Customize Quick Access Toolbar** .
2. Click **More Commands**, and then under **Choose commands from** click **Commands Not in the Ribbon**.
3. Click **Alt Text** and then click **Add**.

•To use the **Alt Text** command on the **Quick Access Toolbar**, select the shape, picture, chart, table, SmartArt graphic, or other object, before you click the toolbar button, and then add your alternative text.



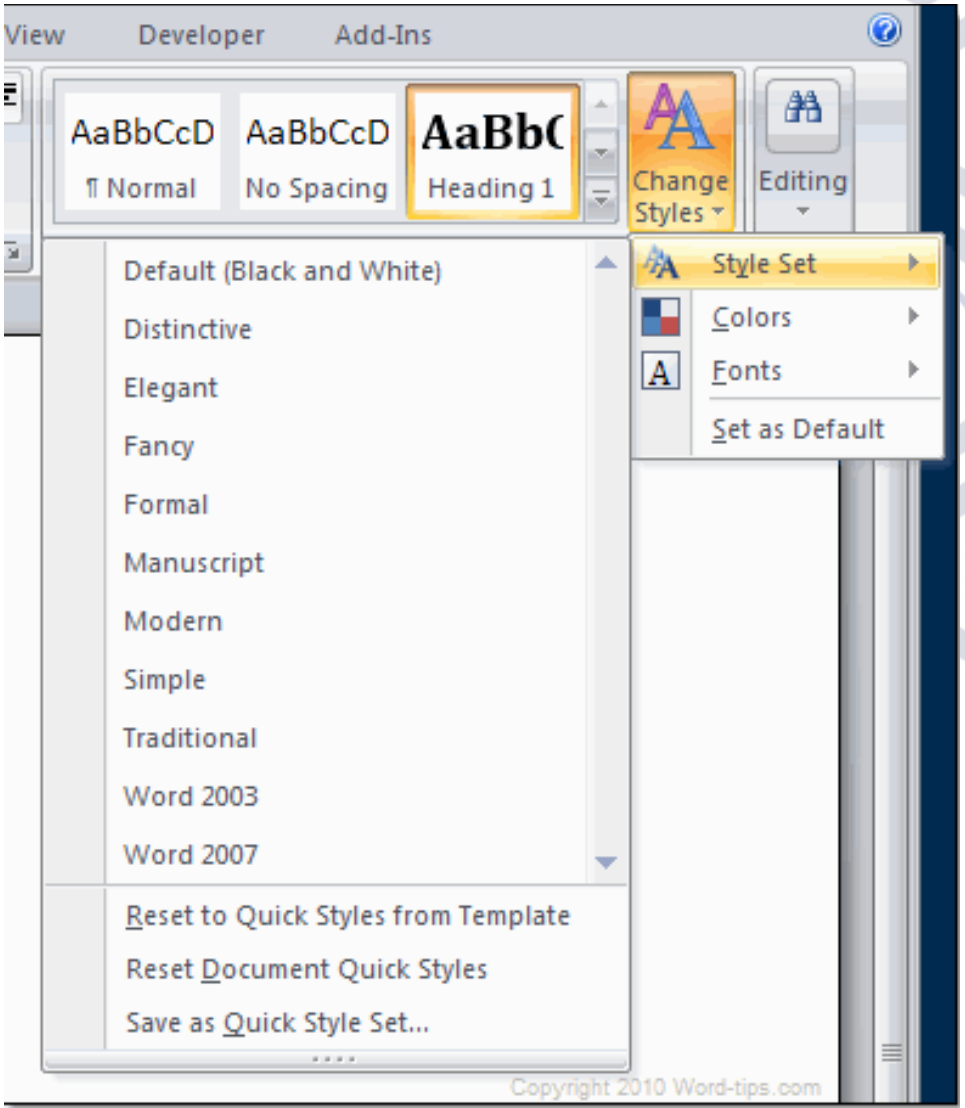
Adding headings in Word



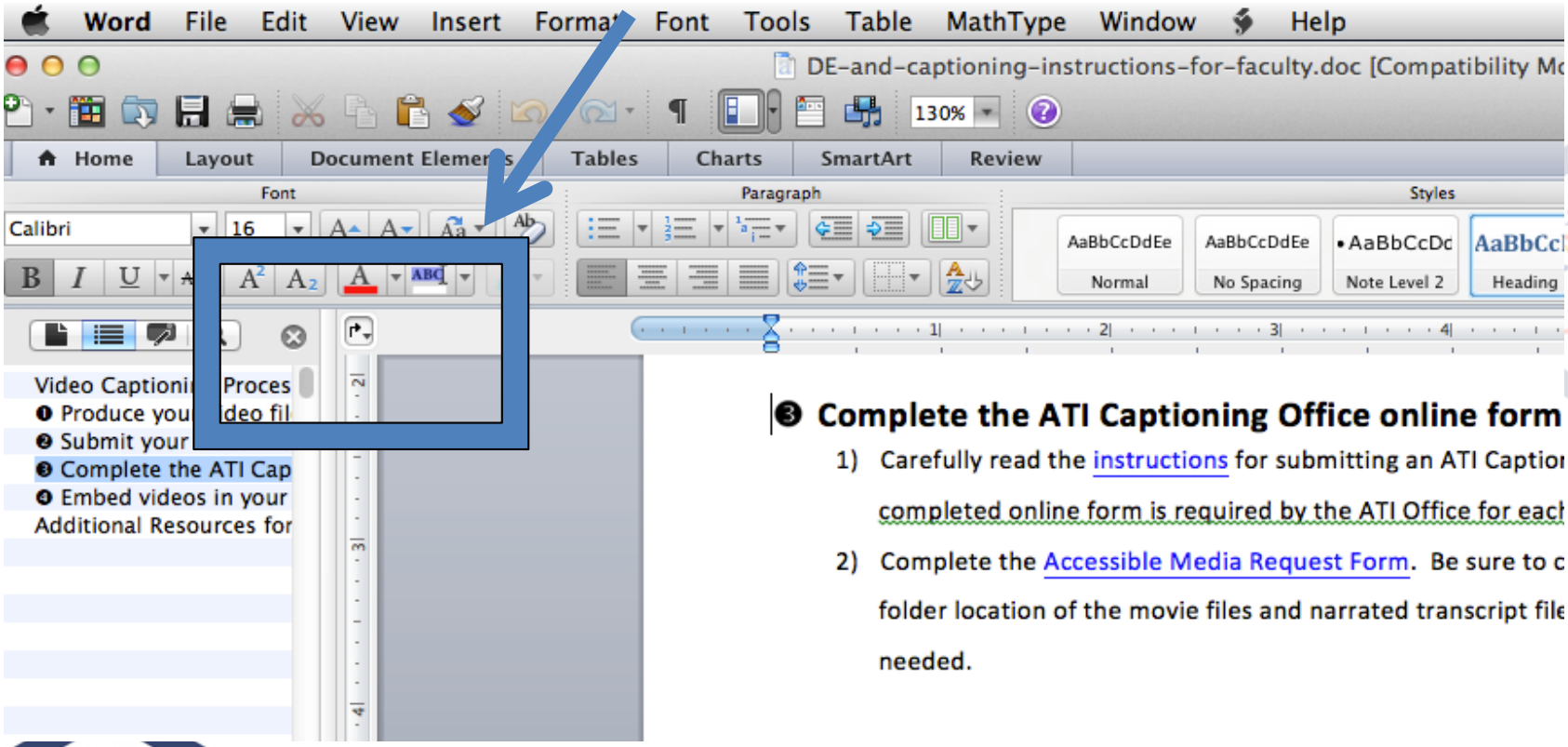
Applying Styles in MS Word

- Changing Style Set:
  1. On the **Home** tab, click **Change Styles**.
  2. Point to Style Set, then hover the pointer over each style set to preview it.
  3. Click the Word 2010/2013 style set to apply it to the document.

- **Video:** [Applying Styles in Word 2010]



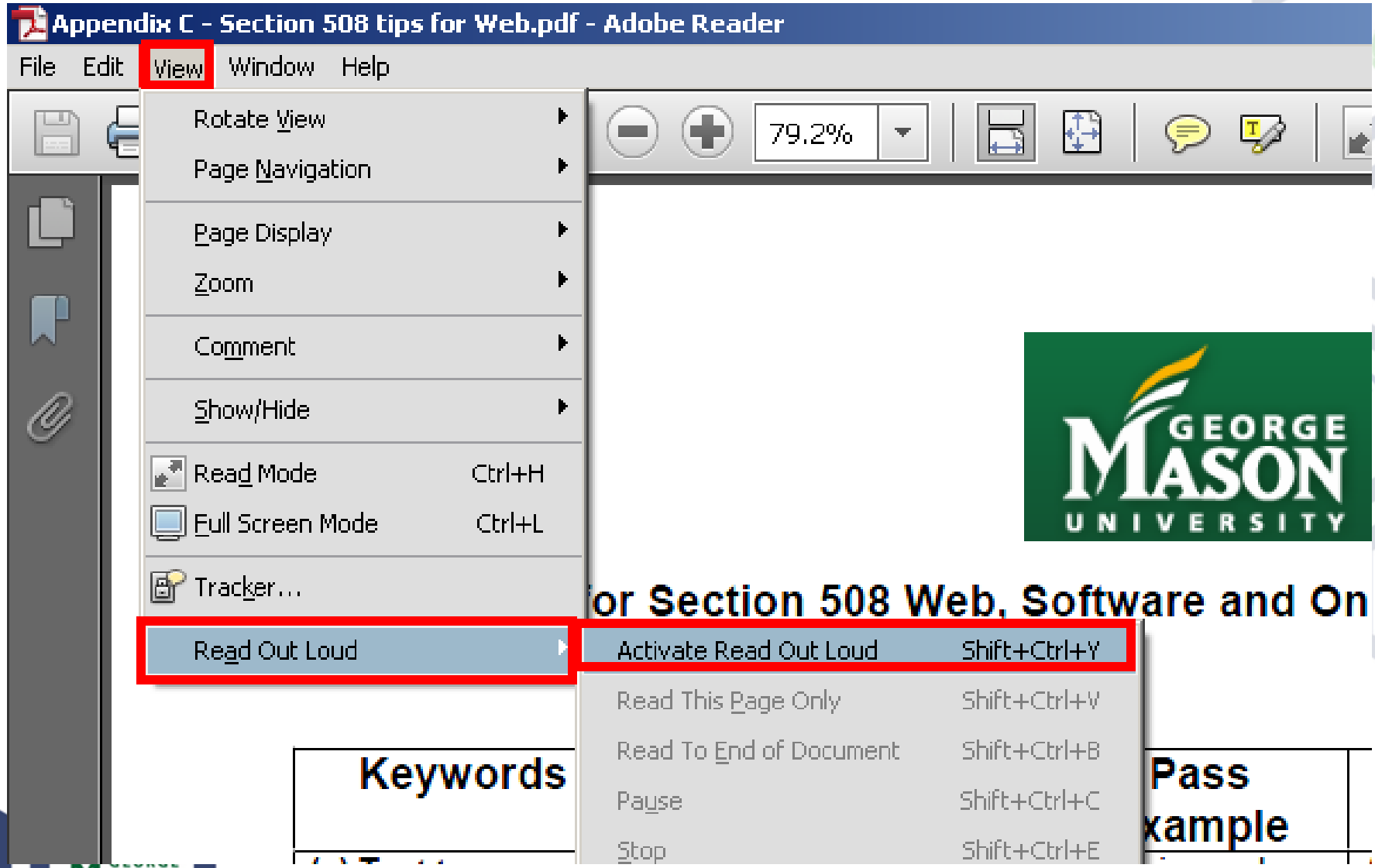
Styling produces a Document Map for easier navigation



Using Adobe Reader to Check PDFs for Accessibility

1. **Can you highlight the text?**
2. **Is the content readable?**

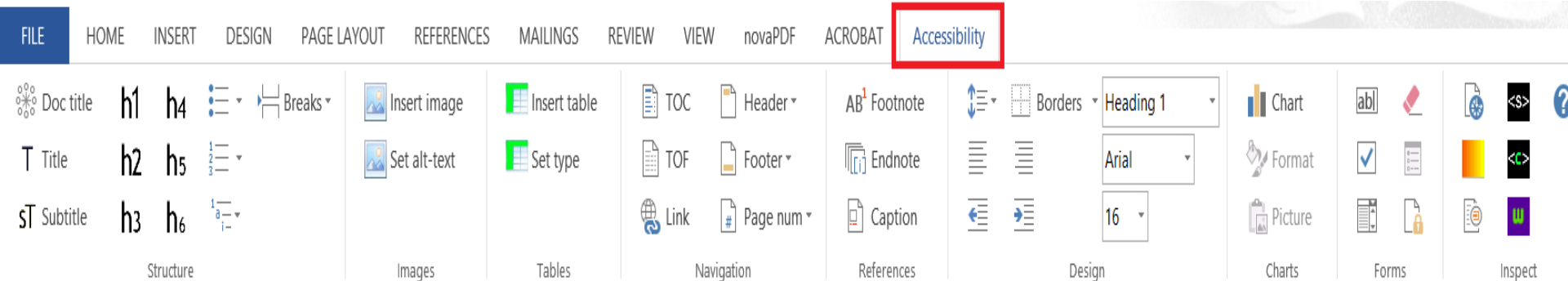
- There are some helpful accessibility features in the free Adobe PDF reader. For example, any PDF file open in Adobe reader can be read aloud with the "Read Out Loud" option.
- Under the **'View'** menu, select **'Read Out Loud'**, then **'Activate Read Out loud'**.
- The Read Out Loud feature of Adobe Reader can be accessed with Keyboard Commands:
  - Activate Read Out Loud: **Shift + Ctrl + Y**
  - Read This Page Only: **Shift + Ctrl + V**
  - Read To End of Document: **Shift + Ctrl + B**
  - Pause/Resume: **Shift + Ctrl + C**
  - Stop: **Shift + Ctrl + E**


Appendix C - Section 508 tips for Web.pdf - Adobe Reader
File
Edit
View
Window
Help
Rotate View
Page Navigation
Page Display
Zoom
Comment
Show/Hide
Read Mode Ctrl+H
Full Screen Mode Ctrl+L
Tracker...
Read Out Loud
Activate Read Out Loud Shift+Ctrl+Y
Read This Page Only Shift+Ctrl+V
Read To End of Document Shift+Ctrl+B
Pause Shift+Ctrl+C
Stop Shift+Ctrl+E
79.2%
GEORGE MASON UNIVERSITY
or Section 508 Web, Software and On
Keywords
Pass
xample

New Accessibility Tool

- VisionAustralia – Document Accessibility Toolbar

- A smarter approach to accessibility, designing documents with accessibility in mind.



Recap

Review Procurement of Supplemental Applications and/or Educate Faculty in determining Books

- Do Professors get to pick any book they want? Do they know to check for online versions?

Does anyone meet with the Publisher Sales Reps?

Identify your Strategic Partners

- Is your institution investing in online learning?

Do you have policies and procedures

- Accessibility training (i.e., captioning, document accessibility)

Is accessibility already integrated into the process?

- Quality Matters? OLC? Bb Course Rubric?

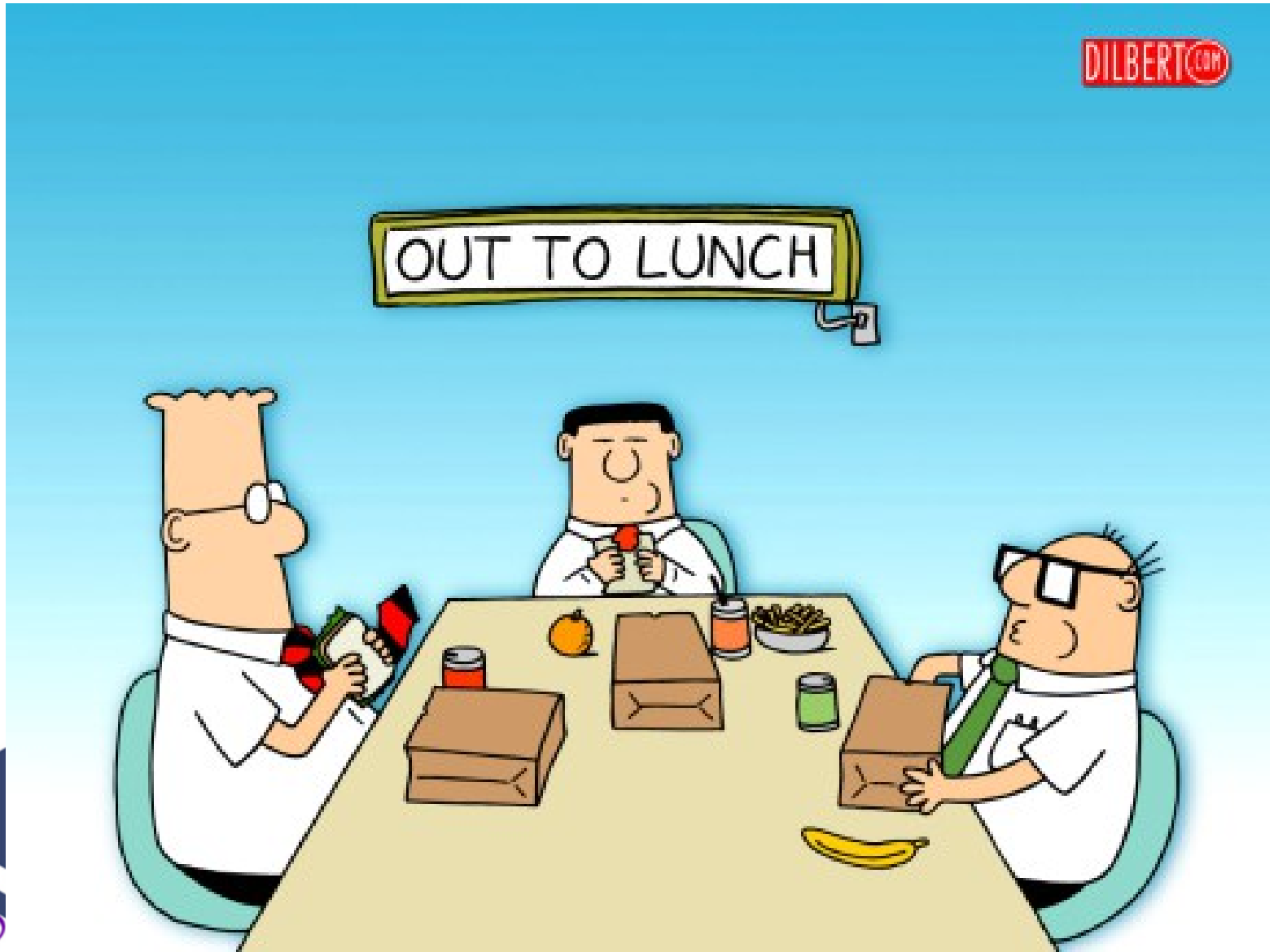
Build off of the platform…

- Canvas? Bb? D2L? Kaltura? Panopto?

Program evaluation?

- Do you have a process for determining success/failure?

Lunch Break



STEAM Content and Alt Format

STEAM – step up from STEM

- Science
- Technology
- Engineering
- **Arts**
- Math

Symbolic Content

- Symbolic content includes math, chemical notation, logic, and almost anything else aside from the basic set of alphanumeric characters found on your keyboard.
- $\exists x \left(\text{Person}(x) \wedge \forall y \left(\text{Time}(y) \rightarrow \text{Happy}(x, y) \right) \right)$
- $(x + a)^n = \sum_{k=0}^{n} \binom{n}{k} x^k a^{n-k}$
- $C_6H_{12}O_6$ or H-(C=O)-$(CHOH)_5$-H

Languages: Roman/Non-Roman Scripts

- English, French, German, Spanish, Portuguese, etc.: Roman writing systems (derived from Latin)
- Non-Roman systems are everything else, including Cyrillic (Russian and related), Greek, Chinese, Japanese, Korean, Hebrew, Arabic…

Expertise and Look-Alike Content

Pitfalls of trying to produce content you aren't familiar with:

$\bar{a}$ $\overline{a}$

$x^2 = y^2$ $x^2 = y^2$

все всё Sí Si ‘aina ‘āina

よろしくおねがいします。 よろしくおねがいします.

Transliteration

- The process of “writing the pronunciation” of a language in a writing system it doesn’t normally use, typically used for language study by a non-native speaker.

茶道 ちゃど chado

Привет Privet

Transliteration Differences

Some languages have more than one transliteration system, depending on the goals of the user; choosing the right one is important for accurate TTS production.

あつし

Atsushi (accurate pronunciation)

Atusi (formal phonemic representation)

Additional complications

- Language study generally expects use of multiple senses, including visual observation, listening comprehension, and verbal production.
- Even alt-tagging an image will require understanding the underlying pedagogical strategy to ensure that the alt tag doesn't defeat the purpose of the exercise.

WHY IS MATH ACCESSIBILITY SO HARD?

The difference between maths & text

Maths is a 2-dimensional notation. Location of a symbol affects its meaning

$$f(x) = a_0 + \sum_{n=1}^{\infty} \left(a_n \cos \frac{n\pi x}{L} + b_n \sin \frac{n\pi x}{L} \right)$$

Fourier Series equation

2 dimensional language when reading,

3 dimensional when writing

Talking Maths: The difference between maths & text

Symbols in maths can mean different things:

$$[\mathbf{AB}]^{-1}$$

Could be read as:

“left parenthesis, boldface capital a, boldface capital b, right parenthesis, superscript minus one”

OR

“inverse of the matrix product, boldface capital a, boldface capital b”

The difference between maths & text: non-linear representation and ambiguity

Maths when read aloud can mean different things

Example 1: “a plus b over 2”:

$$a + \frac{b}{2} \qquad \frac{a+b}{2}$$

Example 2: “2 plus 4 minus 3”:

$$2 + 4 - 3$$

$$2 + (4 - 3)$$

Accurate reading of maths:

Example 1: "a plus b over 2" / "a plus b all over 2"

$$a + \frac{b}{2} \qquad \frac{a+b}{2}$$

Accurate but verbose alternatives

"a plus open fraction b over 2 close fraction"

$$a + \frac{b}{2}$$

"open fraction open parenthesis a plus b close parenthesis over 2 close fraction"

$$\frac{(a+b)}{2}$$

Order of operations Activity:

$$(3 + (2 - 4))^2$$

Using the numbers provided work out as many ways as possible to replicate in symbols:

Three plus two minus four squared

Hint: **there are at least 3 answers to this sum**

PEMDAS – Please excuse my dear Aunt Sally.

Parentheses, Exponents, Multiplication and Division, and Addition and Subtraction

Mathematical semantics

A mathematical expression or equation = a sentence with grammar and semantic structure.

Simple expressions = simple sentences:

"I can run" ..... $x + 2$

Complex expressions can contain sub-clauses and conjugates

"I can run like the wind if the grizzly bear chases after me"...

$$\frac{(x+2)^2}{x+2}$$

Mathematical semantics continued

If possible to drill down into the semantics of an equation then

- audio representation of the notation may be more valuable & put less strain on their working memory capacity
- However, mathematical semantics may have consistent notation but not a consistent vocabulary.
- Need to consider context and localisation

Context and localisation example

Calculate 300,000 + 56

Calculate 300.000 +56

Calculate $300\ 000 + 56$

Calculate 300 000 125 +56

Mathematics is not universally the same!

Then there are symbols

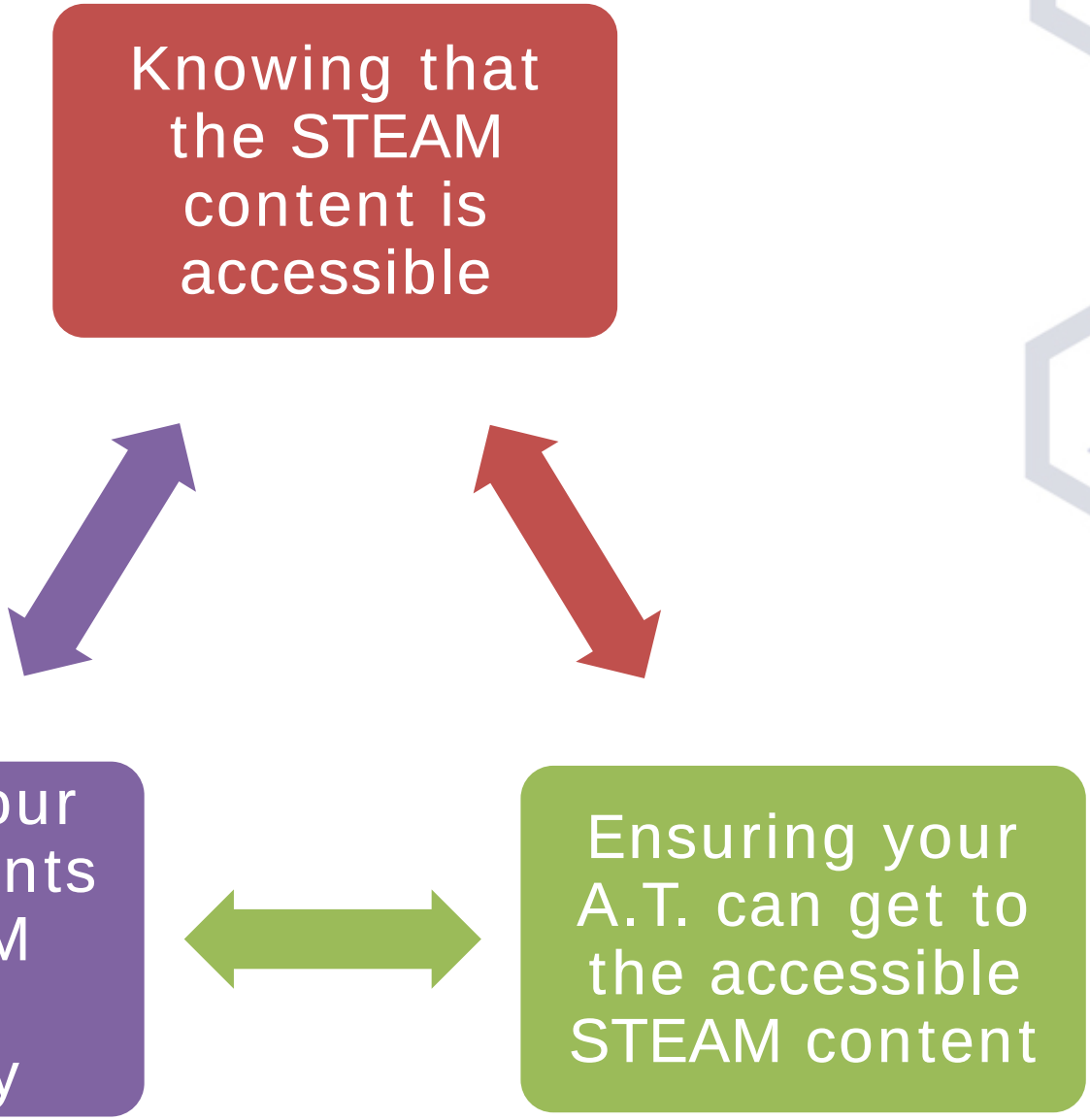
- Most STEM materials will contain symbols and numbers within the text.
- A.T. voices and tools may not read these or worse get the context wrong

a < 2 “a is greater than 2”

$a \leq 2$ “a is greater than or equal to 2”

$\mathbf{M} \subset \mathbf{N}$ “M is a subset of N”

The problem is…



MathML supporting Math semantics:

$$\frac{a+b}{2}$$

- an application of XML for describing mathematical notations and
- captures both its structure and content.
- XML is NOT page layout language.
- **LaTeX** is a mathematical type-setting markup. It does **not** contain information on the type of variable – difficult to detect semantics

```
<math
display='block'>
 <mrow>
  <mfrac>
   <mrow>
        <mi>a</mi>
        <mo>+</mo>
        <mi>b</mi>
    </mrow>
   <mn>2</mn>
  </mfrac>
  </mrow>
</math>
```

LaTeX:

```
\frac{a+b}{2}
```

LaTeX

- Document mark-up language used for technical and scientific material

```
\documentclass{article}
\title{Cartesian closed categories and the price of eggs}
\author{Jane Doe}
\date{September 1994}
\begin{document}
\maketitle
Hello world!
E &= \frac{mc^2}{\sqrt{1-\frac{v^2}{c^2}}}
\end{document}
```

$$E = \frac{mc^2}{\sqrt{1 - \frac{v^2}{c^2}}}$$

LaTeX continued

- Easy to write…. You just need to know the code
- WYSIWYG editor - BaKoMa
- Can convert to accessible form BUT
  - But must have file set up correctly from the outset.

  University of Bath process – produces “clear print” semi-automatically, further processing needed for speech or braille output

MathJax - www.mathjax.org

- JavaScript platform for display of mathematics.
- Browser independent renders in HTML+CSS, SVG or MathML
- Enter maths in MathML, LaTeX or AsciiMath
    1. Link to MathJax in the web pages that are to include mathematics.
    2. Put mathematics into your web pages so that MathJax can display it.
- Now being used to power assistive technology to convert maths notation formats

Useful tools for creating accessible math

- Mathtype (Win & Mac)
  - Add in to Office. Export to main formats including Mathml, LaTeX & Braille
- Mathmagic (Win & Mac)
  - Add in to DTP packages
  - Text transcript of maths (based on Mathspeak)
- Mathcast
  - Free, open source tool output images or MathML
- Microsoft Word
  - Can copy out equations as MathML
- Open Office

Other tools

- WIRIS
  - MathML authoring add-on for websites
  - Demo page allows MathML & LaTeX to be authored
  - Accessibility demo page convert equation to speech
- MathML Cloud
  - Convert MathML, LaTeX & ASCII math to speech for alt-tag, images

Alternative formats

- Tactile – Touching Maths EU project - schools based for blind students but useful ideas http://touchingmaths.net/
- Scanning, screen reading and braille with InftyReader, ChattyInfty and InftyEditor

ePub 3 support for Math?

- Problem – lack of reading systems that support math
- Need the reading system to render MathML in a format that is compatible with A.T.
- https://docs.mathjax.org/en/v2.5-latest/misc/epub.html

Nemeth Braille and Math

- Used and shared from Pearson Publishing Accessibility Group

Braille math is hard!

- Blind students need to create printed math
- Back translation is difficult, time-consuming
- Existing processes are complex, unreliable
- TVIs are often unfamiliar with math notation
- Real-time two-way translation is non-existent

Translating Braille Math

- Online equation editor software component
- Real-time translation from braille into math
- Accessible to both sighted and blind users
- Nemeth Braille
- Content MathML

Presentation v. Content

- Presentation encodes signs/symbols
- Content encodes functional structure
- "x^2+1" v. "1346, 45, 23, 5, 346, 2"
- "x^2+1" v. (plus (power x 2) 1)

Equation Editor (2002)

- WYSIWYG entry for math expressions
- Keyboard input into Content MathML
- Content MathML to Presentation MathML
- Display MathML in a browser (MathJax)

Keyboard to Content

- QWERTY entry for math expressions
- Key-based XML transformations
- Minimal sequential dependencies
- Presentation updated on each key
- "x + 1" v. (plus x 1)

Braille to Content

- Braille entry for math expressions
- Each braille cell becomes a key event
- Non-trivial sequential dependencies
- Presentation updated on each key
- "1346, 346, 2" v. (plus x 1)

Input Sequences

- One QWERTY key effects a transformation
- Sequences of braille keys must be used
- Finite state machine tracks input prefixes
- Transformation updates on each sequence

Contextual Input

- The meaning of a key can depend on context
- Return to baseline from within an exponent
- Degree of a root from within a radical
- Moving from numerator to denominator
- Numeric indicator within a vertical fraction

Usability issues

- Incomplete expressions
- Input position indicator
- Input position selection
- Keyboard navigation

Braille Input Examples

- Numeric indicator
- Baseline indicator
- Type form indicators
- Shape indicators
- Negated operators
- Composed relations

Braille Input Testing

- Web browser input test page
- JavaScript equation editor
- Screen reader device drivers
- Web accessibility APIs
- Braille terminal input

Research Studies

- Two research studies in Fall 2015
- (KY/AZ - Sep, TX - Oct)

- Goal - to collect feedback from multiple populations on EE functionality

- Populations - blind, low vision, regular print readers, learning disabled

- Criteria - high school students who had completed Algebra I

Research Outcomes

- Students had limited knowledge of Nemeth
- Erasing math content was unpredictable
- Working with grouping symbols was difficult
- Entering and closing fractions was unexpected
- Ending trigonometric expressions was unusual

Applications

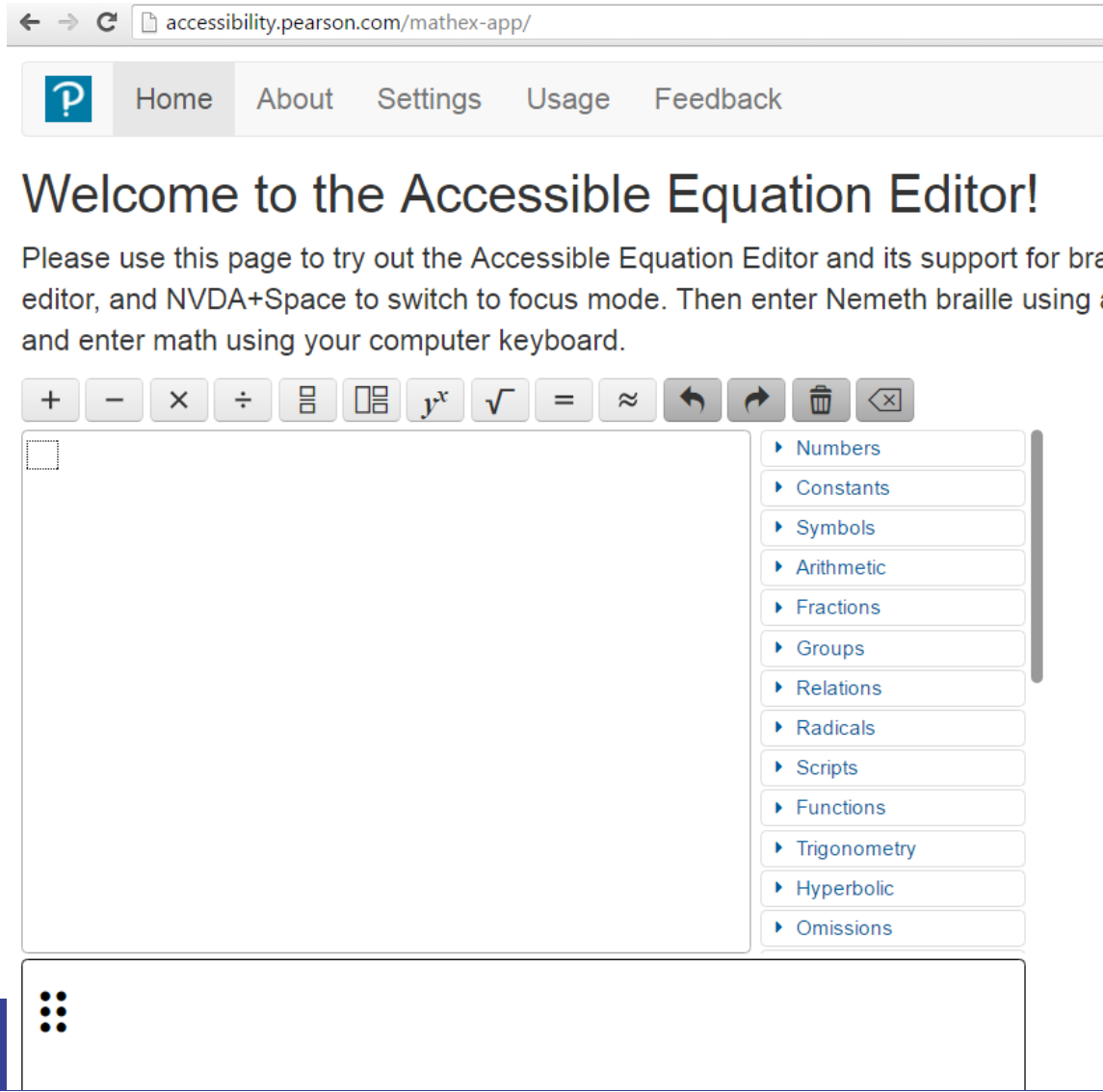
- Web-based translation tools
- Stand-alone translation tools
- Online high-stakes assessment
- Real-time classroom translation

Further work

- Address remaining defect fixes
- Limits, derivatives, integrals
- Combining text and math content
- Braille math usability
- Braille math discoverability

Pearson is designing applications to help

- Real-time Online Two-way Braille-to-Print Mathematical Communication
- http://accessibility.pearson.com/mathex-app/



BYOD

Whether it’s officially supported or not, people are bringing their own devices everywhere now.

Considerations

- Official support for particular devices, operating systems, applications, etc.
- Officially NON-supported devices, OS, apps.
- Do you have a policy at all? Or individual app restrictions?
  - Disproportionate impact on PWD?
    - Ex: refusal to support a particular major browser or OS

Computer Access

- People tend to bring their own devices because it's more convenient and comfortable, albeit more expensive.
- Do you provide computer access? When and where? Equal for PWD who need AT?
- Can people do everything they need to, including downloading/installing software required for their courses? Using AT?

Challenges

- Different devices may render content and learning environments differently.
- Different devices may have different levels of accessibility (built-in or provided via AT).
- OS and app releases/updates are often on a much more rapid cycle on mobile devices than on desktops; keeping up with the changes can be problematic.
- AT for mobile devices is often less robust than that available for desktop computers.
- Mobile devices may not support even “standard” technology that a desktop computer does (ex: Flash).

Open for Discussion/Questions

Contact Information

Kara Zirkle, IT Accessibility Coordinator

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Office Email: ati@gmu.edu

For future questions, please find me on LinkedIn, as my last day at Mason is Friday. I'll be joining University of Miami Ohio starting in August.