

# Accessibility in e-Learning

Presented by:

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# Liberté 0 / Freedom #0



# Liberté 0

<http://liberte0.org/>



# Overview

- What is accessibility?
- What is e-learning?
- Web-based systems
  - Accessible L(C)MSes
- Standards (W3C, IMS)



# Accessibility = ?

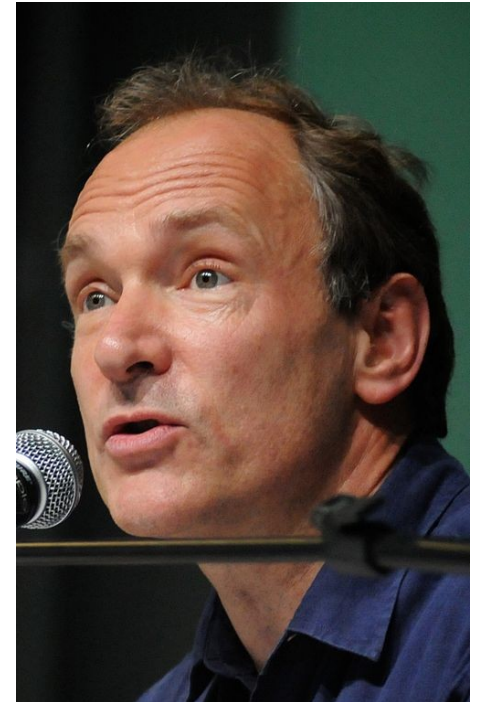
- “the design of products, devices, services, or environments for people with disabilities” [and elderly users] ([Lawton-Henry et al](#))
  - Vision impairments
  - Motor impairments
  - Auditory impairments
  - Learning disabilities, e.g. dyslexia
- 54 M people in USA;  
9.6 M in France ([Insee](#), 2011)



# Accessibility = ?

“The power of the Web is in its universality. **Access by everyone regardless of disability** is an essential aspect”

Tim Berners-Lee, 1997



Tim Berners-Lee  
(Cc-by-2.0, Silvio Tanaka,  
AnOddName)

# Accessibility = ?

## Accessibility Has Become a Must-Have Feature

Over the years, the emphasis on accessibility has shifted from a bonus add-on to a **must-have feature for all high-quality apps**. By making your app accessible, you are enabling individuals and supporting their viewpoints and working styles. This approach both broadens the pool of possible users, while also improving your current users' ability to interact with your app.

Apple: Accessibility Programming Guide for OS X

<http://tinyurl.com/nj894t5>



# E-learning = ?

- Broad term
  - Here: web-based learning in and out of the classroom
  - Also used in “blended learning” (e.g. flipped classroom)
- Out of scope: m-learning, educational games, gamification of learning



# Future of Learning?

- “University of Adelaide is phasing out lectures”,  
*Financial Review*, 28.06.2015,  
<http://tinyurl.com/njvmf3g>  
Instead, lecturers will develop online courses;  
students bring the knowledge to the classroom  
→ flipped learning





# Web-Based Systems

- E-learning platform, learning (content) management system, virtual learning environment, ...
- Deliver learning content
  - Created online or uploaded
- Other features:
  - Discussion forum
  - Learner evaluation
  - ...



# Accessible FOSS L(C)MS

- ATutor (GPL): “the first inclusive LCMS”  
<http://www.atutor.ca/>
  - Conforms to WCAG 1.0 (1999)
  - Conformance to WCAG 2.0 not specified
- Moodle (GPL3)
  - Often used where accessibility is a priority
  - <https://docs.moodle.org/29/en/Accessibility>



# Other FOSS L(C)MSes

Check the documentation!

- Conformance to WCAG (learner side)
- Conformance to ATAG (authoring side)  
<http://www.w3.org/TR/ATAG/>
- Conformance to Section 508 (US accessibility legislation – update is pending)
  - Possibly VPAT (Voluntary Product Accessibility Template)



# WCAG 2.0

- Web Content Accessibility Guidelines 2.0 – W3C Recommendation, 2008:  
[www.w3.org/TR/WCAG20/](http://www.w3.org/TR/WCAG20/)  
(ISO/IEC 40500:2012)
- New to WCAG? →  
[www.w3.org/WAI/intro/wcag.php](http://www.w3.org/WAI/intro/wcag.php)



# WCAG 2.0: Four Principles

- Web content must be “POUR”:
  - **P**erceivable
  - **O**perable
  - **U**nderstandable
  - **R**obust
- Each principle has several **success criteria**
- Each success criterion has documentation, including “**techniques**” and “**failures**”



# Example: Guideline 1.2

Guideline 1.2 Time-based Media: Provide alternatives for time-based media.

[Understanding Guideline 1.2](#)

**1.2.1 Audio-only and Video-only (Prerecorded):** For prerecorded audio-only and prerecorded video-only media, the following are true, except when the audio or video is a media alternative for text and is clearly labeled as such: (Level A)

- **Prerecorded Audio-only:** An alternative for time-based media is provided that presents equivalent information for prerecorded audio-only content.
- **Prerecorded Video-only:** Either an alternative for time-based media or an audio track is provided that presents equivalent information for prerecorded video-only content.

**1.2.2 Captions (Prerecorded):** Captions are provided for all prerecorded audio content in synchronized media, except when the media is a media alternative for text and is clearly labeled as such. (Level A)

**1.2.3 Audio Description or Media Alternative (Prerecorded):** An alternative for time-based media or audio description of the prerecorded video content is provided for synchronized media, except when the media is a media alternative for text and is clearly labeled as such. (Level A)

[How to Meet 1.2.1](#)  
[Understanding 1.2.1](#)

Explains intent of the success criterion

[How to Meet 1.2.2](#)  
[Understanding 1.2.2](#)

Lists techniques for meeting the success criterion

[How to Meet 1.2.3](#)  
[Understanding 1.2.3](#)



# WCAG 2.0: Perceivable

“Information and user interface components must be presentable to users in ways they can perceive”

- Blind persons can't see images → provide text alternatives
- Deaf persons can't hear speech & sound in video → provide captions
- Don't rely solely on shape, size, colour, ...



# WCAG 2.0: Operable

“User interface components and navigation must be operable”

- All UI components need to be keyboard accessible
  - > TAB (& Shift-TAB) through links, buttons, ...
- Keyboard focus must not get trapped  
E.g. the infamous Flash keyboard trap
- Give users enough time





# WCAG 2.0: Understandable

“Information and the operation of user interface must be understandable”

- Text readability, including unusual words and abbreviations
- Determine default language of the content (and language changes inside content)
- Predictable / consistent appearance & operation



# WCAG 2.0: Robust

“Content must be robust enough that it can be interpreted reliably by a wide variety of user agents, including assistive technologies”

- = ensure compatibility with *future* browsers and assistive technologies
- User interface components: name, role, value, state, properties can be exposed through an accessibility API (cf. web apps)



# IMS Global Learning Consortium

- IMS Guidelines for Developing Accessible Learning Applications (2002):  
<http://tinyurl.com/yju295a>
- Several technical specifications related to accessibility:
  - IMS Access For All
  - IMS Learner Information Package Accessibility for LIP
  - Accessibility features in IMS Question & Test Interoperability (QTI)



# IMS Access For All

- Matching user profiles with digital media – based on access modes: visual, auditory, textual or tactile
- Tag learning resources with metadata
- Select learning resources based on user's profile
- Implemented in TILE:  
<http://www.barrierfree.ca/tile/>



# IMS Question & Test Interoperability (QTI)

- “standard format for the representation of assessment content and results” (Wikipedia)
- XML format → implementations transform it into HTML, Flash, Java applets, ...
- Version 1.2 lacked important accessibility features
- Version 2.0: improved accessibility based on feedback



# Now Go and Be Accessible ;-)

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