



# The role of Assistive Technology in UDL

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# Overview

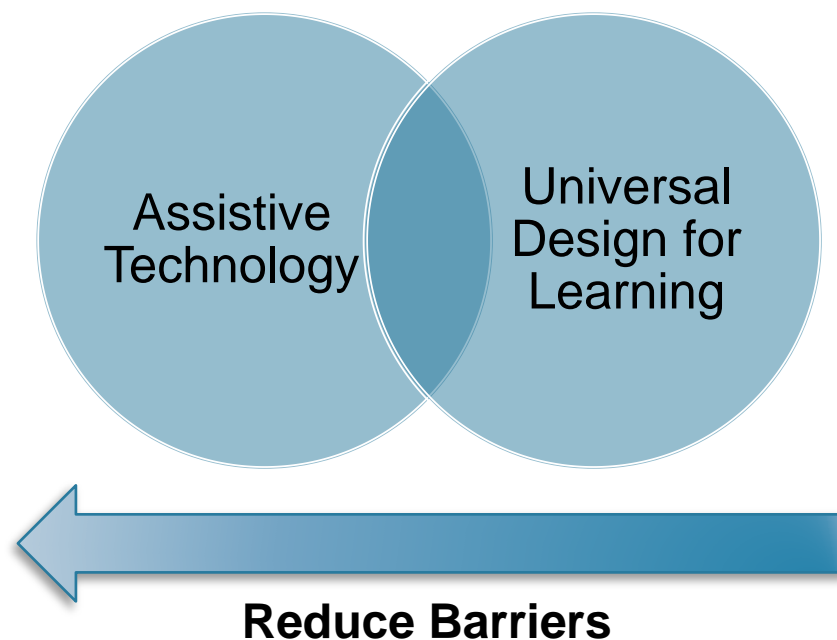
- Introduction
  - Relationship between AT and UDL
- Representation
- Action and Expression
- Engagement
- Summary
- Resources



# AT & UDL – Two Sides of the Same Coin\*

AT & UDL while different are complementary

- Similar Goals – Increased Access, Participation and Progress
- Accessible Curriculum Content increases the efficiency of AT
- AT can help support students for whom the Accessible Curriculum still poses a barrier.
- UDL content must be designed to consider AT and AT should fully utilise UDL content.



“When UDL and AT are designed to co-exist, learning for all individuals is enhanced.”

[\\*David H. Rose, Ted S. Hasselbring, Skip Stahl, and Joy Zabala](#)



# UDL & AT – Where they differ

- UDL seeks to educate those responsible for the design of curricula and learning environments on how to make them accessible and effective for the widest range of students.
- AT looks at the barriers faced by individuals and seeks to overcome those barriers through the use of appropriate tools.



# Assistive Technology for Learning

“Essentially, the goal of education has shifted from knowledge acquisition to learner expertise”\*

Technology empowers the student and offers them tools to support independent learning. Knowing what tools to use and how to use them can therefore be seen as an pivotal step in becoming an expert learner.

\* [Anne Meyer, Universal Design for Learning: Theory and Practice](#)

# Closer look at UDL

3 Principles

9 Guidelines

31  
Checkpoints

The Checkpoints are a useful tool through which educators can examine their curriculum according to the Principles of UDL.

Over the next few slides we will look at these Checkpoints from the AT perspective.

- ★ What Checkpoints can the learner achieve independently through proper use of the appropriate (assistive) technology?
- How can educators facilitate learner independence through an understanding of the available technology, its capabilities and limitations?
- ▲ What checkpoints are poorly served by current technology (from the learner perspective) and rely on the educators creative use digital/web technologies and innovative class based activities?



# Provide Multiple means of Representation

★ Can be achieved by learner using technology	● Supported by technology	▲ Must be provided for in curriculum	
1. <u>Provide options for perception</u>			
1.1 <u>Offer ways of customizing the display of information</u>			★
1.2 <u>Offer alternatives for auditory information</u>			▲
1.3 <u>Offer alternatives for visual information</u>			●
1. <u>Provide options for language, mathematical expressions, and symbols</u>			
2.1 <u>Clarify vocabulary and symbols</u>			●
2.2 <u>Clarify syntax and structure</u>			●
2.3 <u>Support decoding of text, mathematical notation, and symbols</u>			★
2.4 <u>Promote understanding across language</u>			★
2.5 <u>Illustrate through multiple media</u>			▲
1. <u>Provide options for comprehension</u>			
3.1 <u>Activate or supply background knowledge</u>			▲
3.2 <u>Highlight patterns, critical features, big ideas, and relationships</u>			▲
3.3 <u>Guide information processing, visualization, and manipulation</u>			●
3.4 <u>Maximize transfer and generalization</u>			●

# Representation

Technology		UDL
<ul style="list-style-type: none"> <li>• <a href="#">TextGrabber</a></li> <li>• <a href="#">AppWriter</a></li> <li>• <a href="#">Readability</a></li> <li>• <a href="#">Stylish</a></li> <li>• <a href="#">Inbuilt Accessibility Features</a></li> </ul>	<p>While providing alternative fonts, colours and magnification will increase the accessibility of your content. The tools listed on the left column will help the student access <b>all</b> content.</p>	<p>Customise the Display</p>
<ul style="list-style-type: none"> <li>• <a href="#">TextHelp</a></li> <li>• <a href="#">Co:Writer</a></li> <li>• <a href="#">MyStudyBar</a></li> <li>• <a href="#">ZoomText</a></li> <li>• <a href="#">GeoGebra</a> &amp; <a href="http://tube.geogebra.org/">http://tube.geogebra.org/</a></li> </ul>	<p>While using unnecessarily complex language is widely regarded as bad practice over simplifying language can inhibit learning. Use appropriate language and terminology for the subject and level ensuring learners who need additional support have the tools and know how to use them.</p>	<p>Support decoding of text, mathematical notation, and symbols.</p>
<ul style="list-style-type: none"> <li>• <a href="#">Google translate</a></li> </ul>	<p>While automatic language translation does not always produce perfect results it can be an invaluable tool for learners for whom English is not a first language.</p>	<p>Promote understanding across language</p>



# Representation

Technology		UDL
<ul style="list-style-type: none"> <li>• <a href="#">JAWS</a></li> <li>• <a href="#">ChromeVox</a></li> <li>• <a href="#">VoiceOver</a></li> <li>• <a href="#">NVDA</a></li> </ul>	<p>Context appropriate and informative alttext (alternative text) needs to be provided, Audio Description where necessary and proper formatting of content.</p>	<p>Offer alternatives for visual information</p>
<ul style="list-style-type: none"> <li>• <a href="#">Mindjet</a></li> <li>• <a href="#">Popplet</a></li> <li>• <a href="#">Coggle</a></li> <li>• <a href="#">Xmind</a></li> </ul>	<p>While literacy support software should be encouraged providing a subject specific Glossary would also be desirable.</p>	<p>Clarify vocabulary and symbols</p>
<ul style="list-style-type: none"> <li>• <a href="#">Visuwords</a></li> <li>• <a href="#">Visual Dictionary</a></li> </ul>	<p>Numeracy and literacy support software may not always provide the support needed.</p>	<p>Clarify syntax and structure</p>
<ul style="list-style-type: none"> <li>• <a href="#">Rewordify</a></li> <li>• <a href="#">Wordle</a></li> </ul>	<p>Rather than just providing mindmaps, diagrams, visualisations and flow charts create them as part of the lesson.</p>	<p>Guide information processing, visualization, and manipulation</p>



# Subtitles - Offer alternatives for auditory information

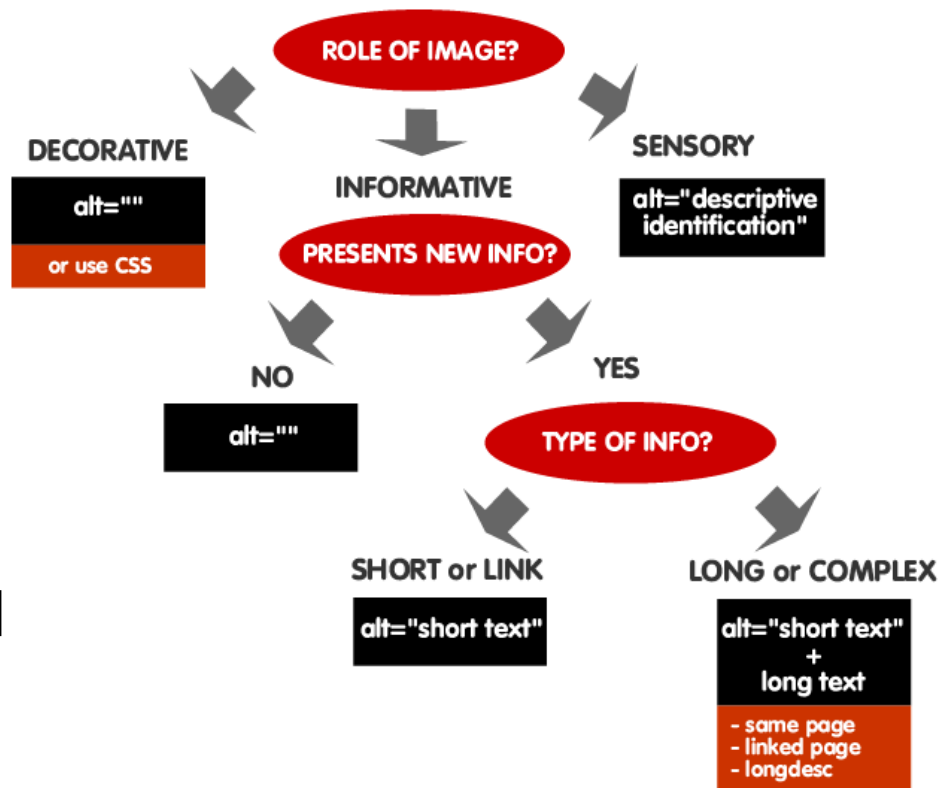
- There is no getting around the fact that subtitles need to be written although some services and techniques may lessen the pain.
- [Amara – Subtitling Community](#)
- [Using Youtube](#)



# Text Alternative Decision Tree

Alternative Text should:

- present the **CONTENT** and **FUNCTION** of the image.
- be succinct.
- depend heavily on the image's context.
- Decorative images still need an alt attribute (web), but it should be null (alt="").
- For those on Twitter think of it like tweeting!



# Provide Multiple Means for Action and Expression

★ Can be achieved by learner using technology	● Supported by technology	▲ Must be provided for in curriculum	
1. <u>Provide options for physical action</u>			
4.1	<u>Vary the methods for response and navigation</u>		●
4.2	<u>Optimize access to tools and assistive technologies</u>		●
1. <u>Provide options for expression and communication</u>			
5.1	<u>Use multiple media for communication</u>		●
5.2	<u>Use multiple tools for construction and composition</u>		●
5.3	<u>Build fluencies with graduated levels of support for practice and performance</u>		▲
1. <u>Provide options for executive functions</u>			
6.1	<u>Guide appropriate goal setting</u>		▲
6.2	<u>Support planning and strategy development</u>		★
6.3	<u>Facilitate managing information and resources</u>		★
6.4	<u>Enhance capacity for monitoring progress</u>		●

# Action & Expression

Technology		UDL
<ul style="list-style-type: none"> <li>• <a href="#">MyStudyLife.com</a></li> <li>• <a href="#">Cogi</a></li> <li>• <a href="#">Evernote</a></li> <li>• <a href="#">OneNote</a></li> <li>• <a href="#">Notability</a></li> </ul>	<p>Planning and strategy development can be supported by using Mindmapping, to-do lists, calendar and reminders, essay writing tools, citation tools and techniques like time boxing.</p>	<p>Support planning and strategy development</p>
<ul style="list-style-type: none"> <li>• <a href="#">SIRI</a></li> <li>• <a href="#">Cortana</a></li> <li>• <a href="#">Life Reminders</a></li> <li>• <a href="#">Pomos</a></li> <li>• <a href="#">Focus Booster</a></li> <li>• <a href="#">Zotero</a></li> <li>• <a href="#">EssayMap</a></li> </ul>	<p>Note taking and organisation can be difficult for some learners but fortunately there are a wide range of supports on every platform.</p>	<p>Facilitate managing information and resources</p>

# Speech Recognition

Technology	Description
<a href="#">Dragon Naturally Speaking</a>	Probably the best known and most popular. Works offline. Can be trained to users voice and so offers improved accuracy. Premium version highly customisable.
<a href="#">MathTalk</a>	This is a plugin for DNS rather than a stand alone product. Allows the user to voice any math...pre-algebra, algebra, trig, calculus, statistics, graphing...
Inbuilt Speech Recognition – <a href="#">Windows</a> , <a href="#">Apple</a>	Both good free options to trial Speech Recognition
<a href="#">Google Chrome Speech Recognition</a>	A number of Chrome extensions and Google Docs addons offer a surprising level of accuracy and ease of use.



# Provide Multiple Means for Engagement

★ Can be achieved by learner using technology	● Supported by technology	▲ Must be provided for in curriculum	
1. <u>Provide options for recruiting interest</u>			
7.1	<u>Optimize individual choice and autonomy</u>		▲
7.2	<u>Optimize relevance, value, and authenticity</u>		▲
7.3	<u>Minimize threats and distractions</u>		●
1. <u>Provide options for sustaining effort and persistence</u>			
8.1	<u>Heighten salience of goals and objectives</u>		▲
8.2	<u>Vary demands and resources to optimize challenge</u>		▲
8.3	<u>Foster collaboration and community</u>		●
8.4	<u>Increase mastery-oriented feedback</u>		▲
1. <u>Provide options for self-regulation</u>			
9.1	<u>Promote expectations and beliefs that optimize motivation</u>		▲
9.2	<u>Facilitate personal coping skills and strategies</u>		●
9.3	<u>Develop self-assessment and reflection</u>		▲

# Engagement

Technology		UDL
<ul style="list-style-type: none"> <li>• <a href="#">Coggle</a></li> <li>• <a href="#">Trello</a></li> <li>• <a href="#">Wunderlist</a></li> <li>• <a href="#">Simple To-Do List</a></li> <li>• <a href="#">Padlet</a></li> </ul>	<p>Working online is difficult for those easily distracted. Use technology to remove the temptation of social media, distracting ads and popups.</p>	<p>Minimize threats and distractions</p>
<ul style="list-style-type: none"> <li>• <a href="#">FocusWriter</a></li> <li>• <a href="#">StayFocused</a></li> <li>• <a href="#">Readability</a></li> <li>• <a href="#">AdBlocker</a></li> </ul>	<p>Establishing an online community and engaging in online collaboration can be more accessible for some learners and allow people to show different abilities.</p>	<p>Foster collaboration and community</p>
	<p>As previously mentioned to-do lists, time boxing and reminders can be tools that will prove useful throughout life if they can be integrated into a learners workflow.</p>	<p>Facilitate personal coping skills and strategies</p>





# Summary

- While text is the dominant medium for both educational content and deliverables AT for literacy support will be essential for some learners.
- Educators need to be aware of Literacy, Productivity and Organisation technologies. their limits and capabilities.
- Although not part of the curriculum, training in the use of assistive software will be key in some learners success.
- Giving learners the tools to adapt content to their own needs and preferences should be seen as preferable to adapting the content for them.



# Resources

- [Literacy Support Module](#)
- [Productivity and Organisation Module](#)
- Both the above are also available on our [ATandMe.com](#) Blog.
- StudySmart – Apps for reading writing and organisation  
<http://www.enableirelandat.com/mod/scorm/player.php>
- The above module is available on our eLearning platform at [www.enableirelandAT.com](http://www.enableirelandAT.com). Log in as Guest.