Providing literacy support using technology and UDL

This guide uses the Universal Design for Learning (UDL) lens to identify common ways that technology can be used to access and support students in reading, writing and and organisational tasks.

This guide is intended for teachers and is appropriate for primary, intermediate and secondary levels.

Contents

Once you have read this guide you are welcome to contact the Connected Learning Advisory to get more personal assistance. We aim to provide consistent, unbiased advice and are free of charge to all state and state-integrated New Zealand schools and kura. Our advisors can help with all aspects outlined in this guide as well as provide peer review of the decisions you reach before you take your next steps.

For more information visit www.connectedlearning.org.nz
Check out our resources at resources.connectedlearning.org.nz
Call us for personalised service on 0800 700 400
Make a personal inquiry via our online form at query.connectedlearning.org.nz
Email info@connectedlearning.org.nz

Using the Universal Design for Learning (UDL) lens

Universal Design for Learning UDL provides a framework that we can use to consider the needs of all learners and design a curriculum and environment that cater for everyone from the outset.

Universal Design for Learning (UDL) is a term coined by CAST. They define it as *...a set of principles for curriculum development that give all individuals equal opportunities to learn.*

Rather than address individual needs through one off adaptations of differentiation, UDL aims to remove barriers to learning and create inclusive learning environments (see picture below).

> *Last year I had dyslexia and I felt different, this year I don't feel different. It's much easier.*
>
> Felix on moving into an iPad class where UDL design principles were applied
> Dyslexia: Using an iPad to support learning

UDL is not a technology framework but digital technologies can provide options for students that address specific learning barriers and provide supports that simply were not available in the past.

EQUALITY VERSUS EQUITY

In the first image, it is assumed that everyone will benefit from the same supports. They are being treated equally.

In the second image, individuals are given different supports to make it possible for them to have equal access to the game. They are being treated equitably.

In the third image, all three can see the game without any supports or accommodations because the cause of the inequity was addressed. The systemic barrier has been removed.

Image: Advancing Equity and Inclusion- A Guide for Municipalities ©CAW

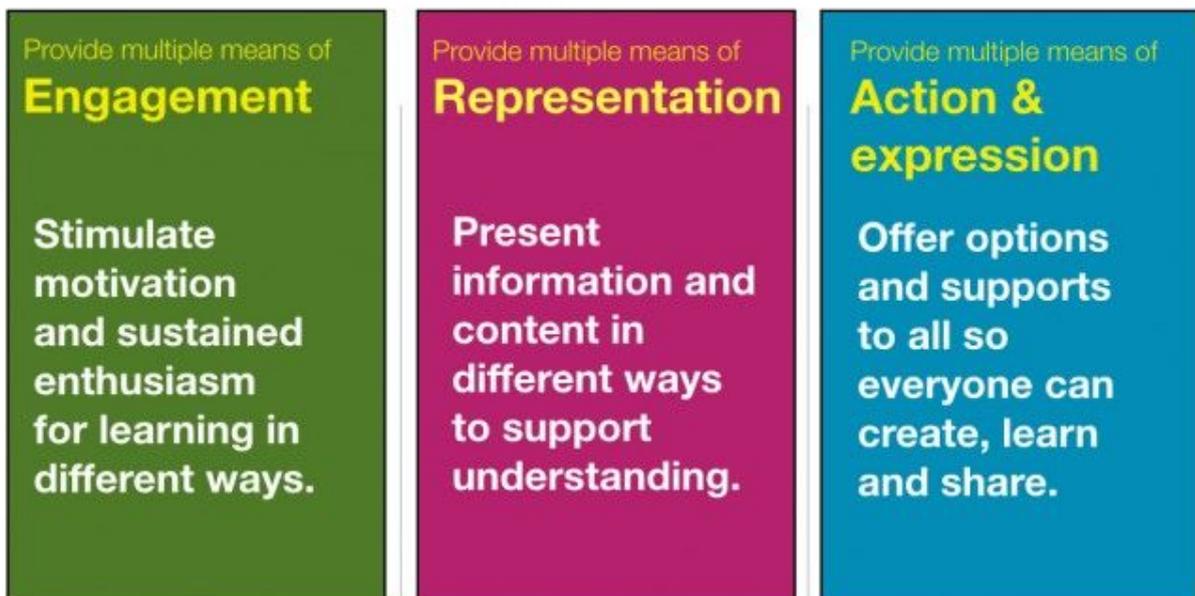| **Video example of UDL and technology in literacy support:**	**Examples from other schools**
[Dyslexia: Using an iPad to support learning](#)	[Raising student writing levels using Google Docs](#) - Students collaborating, providing feedback and feedforward
	[Improving student writing using Blogs: An authentic audience giving specific feedback](#) - Includes parents giving online feedback to the students
	[Writing together: Writing with iPads](#) - Making the class programme accessible for learners

The universal design framework uses neuro and learning sciences to identify three principles:

1. **Engagement:** creating engaging environments and sustaining motivation

2. **Representation:** supporting independent access to usable learning materials

3. **Expression:** providing multiple ways to create, learn and demonstrate understanding

Provide multiple means of **Engagement**
Stimulate motivation and sustained enthusiasm for learning in different ways.

Provide multiple means of **Representation**
Present information and content in different ways to support understanding.

Provide multiple means of **Action & expression**
Offer options and supports to all so everyone can create, learn and share.

Universal Design for Learning: 3 principles

Image:tki.org.nz

Identifying learning needs
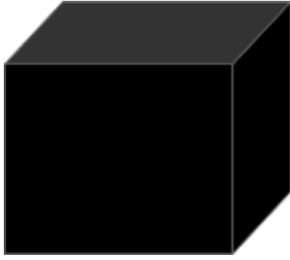
Use the Black Box Technique to clarify what you want the digital technology to do to support the student.

The first step in providing the right digital technologies to support any student is to identify their needs. The black box technique allows you to make a recommendation for appropriate technology for a student or group even if you have never heard of that technology before. It is very simple and keeps the focus on learning.

Simply imagine that you are giving your student a black box. List the features that the black box would need to have to support that student's learning. Once you have developed the list, use it to select technology options with the specific features you are looking for.

Use your own networks, local specialists and web searches to find information that you need or you can contact the Connected Learning Advisory for further support.

You can use the technique to select devices or software and apps. Below is a simplified example of a feature list for a student whose learning goals are:

- To independently complete tasks involving reading and writing
- To increase the quality, quantity and legibility of their writing

Example of Feature	Educational reason for feature	iPad	Chromebk	Laptop
Keyboard & Voice typing	Increased writing speed and improved legibility because the student struggles to write with a pen	Y	Y	Y
Dyslexia font and resize	Can convert text to dyslexia font and increase font size for ease of reading	Y	Y	Y
Text-to-speech	Independent access curriculum material above their current reading age. Support editing.	Y	Depends on additional apps	Depends on additional software
Alternative format	Can access multimedia resources to support comprehension	Y	Y	Y
Portable & light	Carry from class to class and from school home	Y	varies	varies
Inclusive	Same technology as is used throughout school	?	?	?

Technology options for literacy support
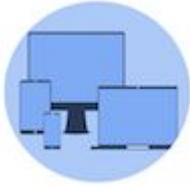
The following tables outline some common ways to use technology to support students at any curriculum level.

There is a large amount of information included but this is neither a comprehensive list or a must do checklist - rather it is intended to give some concrete examples of how technologies can be used to support a variety of learners.

First: Clarify learning intention

The range of technology supports you offer will will depend on the learning intention for any specific activity or lesson.

For example, tools such as voice typing (speech recognition) are appropriate when the learning intention is to have students show their understanding of a concept or tell a story but would not be appropriate if the intention is to develop the 'skill of writing with a pen or keyboard' or to spell words correctly.

UDL Principle: Engagement

This section outlines some examples of ways to utilise technologies to support students **to be engaged and sustain motivation**.

Engagement	Rationale	Examples
Organisation and self management	Support routines with visual schedules and allow students to plan for and anticipate transitions.	Examples: ● create visual schedules or routines using your own school images and symbols ● visual schedules (Talklink guide) ● visual schedules iPad app review on the Assistive Technology VLN
Cultural and personal connections	Technology allows students to create rather than consume - using multimedia, student voice, images and video from their own school, community, culture and country. It can provide opportunities for each student to make connections with their own culture and identity and value Māori as tangata whenua and Pasifika cultures.	For example: ● use NZ's official languages: NZ english accent, Te Reo and NZ Sign Language ● use Māori macrons ● TKI resources to support Maori medium, English medium and Pasifika ● connect with community – share digital stories from students and from family/whanau, use the talanoa model.
Audience	Giving students an audience that is wider than just their teacher can be both motivating and enriching. Technology allows students to collaborate with others anywhere, anytime and using any device.	Examples: ● Share learning and collaborate with whānau and community via the cloud ● Blog - blogger, wordpress.com, wordpress.org, and more ● Publish talking books - tarheel, iBooks

UDL Principle: Representation

This section outlines some examples of ways to utilise technologies to support students to **access learning materials (including reading material) and to support comprehension**.

Representation	Rationale	Examples
Provide digital versions of key material in the cloud	Handouts, workbooks and writing on whiteboards are some of the least accessible options for some students. When content is digitised, students can use their personal preferences to access material. Using consistent school and class systems for sharing resources helps students find material easily, provides 24/7 access and can reduce the need for whole class teaching.	To convert an image of text (e.g. worksheet or pdf) into editable text in Google or Microsoft. When content is digitised, students may use dyslexia fonts, change colours, size, style and spacing, have text read by the computer (text-to-speech) or using braille or a screen reader.
Make text-to-speech an option	Text to Speech allows students to access text above their current reading age, can support comprehension. Some text to speech software can also save files to audio formats (e.g. mp4, wav)	Options for text to speech: ● Microsoft Office ● ReadWrite for Google ● Mac operating system ● iPad iOS 'speak selection' See this text to speech VLN blog for more
Use multimedia	Share essential information in multiple formats Using only one media means that if a student has a specific disability in that one media the material will be inaccessible to them (e.g. reading disability).	Multiple format examples include: ● Text with images, diagrams or infographics ● Video with closed captions e.g. see YouTube captions ● Use web images (but be careful that you have permission): see A guide to free photo resources on the Web for educators
Provide key content or models in alternative formats	Simply restating a concept in a different way or in another format can help students to understand or reinforce learning. Sometimes it may mean creating your own content but students and peers can also create resources for others - and this can consolidate their own learning.	Sometimes alternatives are already available. For example: ● Teachertools or Kahn Academy ● Maths videos – Teacher YouTube Channel (Andrew Ricciardi, Waimea College) Create your own. For example: ● use Educreations, Showme or Explain Everything apps ● Screencastify to make a video and voice recording of your screen

UDL Principle:
Action & Expression

This section outlines some examples of ways to utilise technologies to support students to **create, learn and express themselves and demonstrate understanding**.

Action and Expression	Rationale	Examples
Make voice typing an option	Voice Typing allows you to speak aloud to your device and have words typed as you speak. The software has improved so significantly in the last few years that it is now a real option for text entry. This software may work well for students who can express themselves well verbally but struggle to write.	For example: ● Voice typing in Google Docs ● Mac OS ● iPad iOS dictation (not siri) ● Android phone ● Online Dictation (web) ● Windows speech recognition For more information see the Assistive Technology Voice typing blog
Provide frameworks and models	Graphic organizers and visual thinking strategies to help to break tasks down into smaller pieces and to organise information in a way that makes it more visible and easier to understand.	For example: ● Graphic organisers ● Wiki (PeaK ICT Kawerau) ● Visual thinking tools:popplet (web and app), bubbl.us (web), Microsoft Visio, Lucidchart, Inspiration
Offer word prediction	Word prediction software provides more in depth support for spelling, reading, writing and editing and reduces the number of keystrokes necessary for typing words. It predicts a required word as a student writes, producing a list of words beginning with the letter sequence typed.	For example ● WordQ ● Read & Write For more information see software comparison
Provide alternatives to writing	If the learning intention is to show what the learner knows or understands a writing format is just one of a range of ways that can be offered. Multimedia tools mean that his content can be kept to show a record of student learning.	For example: ● Images, drawings and doodles (take a screenshot or photo) ● Voice recording ● Video (iMovie, WeVideo etc)

Useful Links	Further information in a much more varied format is available on the Inclusive Education website. The site has a wealth of resources and NZ examples of UDL in action. The Enabling e-Learning site also has a large number of examples of e-learning practice in NZ and includes an excellent video library.

This guide has been produced in response to a number of specific queries about literacy support from schools.

It should not be read as a recommendation or endorsement of any specific product. The Connected Learning Advisory is a Ministry of Education supported service that provides schools with technology information relevant to their queries and does not recommend one product over another.

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