



Use Multiple Modalities

When considering academic content and planning for instruction, it is important for teachers to be aware of the principles of Cognitive Load Theory as they relate to students' abilities. With this consideration, it is also important to identify students with slow processing speed or impaired working memory. Technology can help alleviate difficulties in these areas. Below is an introduction to specific programs and research that can be considered to promote students' engagement in class content. Similar programs will be discussed more in-depth in future editions of the Free Landmark Teaching Strategies publication.

Reading



Research: Research in the area of reading disabilities highlights that students who struggle with reading spend a significant amount of cognitive energy trying to decode text, limiting their capacity for comprehension (LaBerge & Samuels, 1974). Based on this research, it stands to reason that in order to allow students to devote more cognitive energy to comprehension, they need to reduce the amount of energy expended on decoding. This could be done in two main ways:

- Lessen the complexity of the decoding by using adapted versions of books, which tend to have lower readability levels.
- Provide technological tools for more challenging materials to be read aloud to support decoding while encouraging increased comprehension.

Reading Programs:

- **Text-to-Speech:** Many devices now have built in text-to-speech capabilities. Usually, this feature can be turned on using the “accessibility” function in settings or system preferences. To figure out how to turn on the text to speech, simply search “Text to speech” on the internet for whatever device you are using. When turned on, text-to-speech functionality will allow whatever is on the screen to be read aloud no matter what device you are using.
- **Bookshare:** Bookshare is an online database of textbooks and novels that is available for free to any student with a documented print disability. Bookshare has a built-in reader with setting controls.
- **Online Texts:** Various online websites provide free access to web-based texts. Examples of such websites include Project Gutenberg and Literature.org.

Writing



Research: Similar to reading, research related to writing abilities suggests that the cognitive energy required for spelling and writing can interfere with higher order skills, such as planning and content generation (Graham, 1990). This research, as well as research suggesting that students with learning disabilities tend to choose less sophisticated vocabulary in favor of simpler, easier to spell words (Higgins, 1995), supports the idea that technology can assist in the level of production.



Writing Programs:

- **Graphic organizers and Mind mapping programs** can assist students in the pre-writing (brainstorming and organizing) phase of writing. Using Landmark's [five step writing process](#), brainstorming and organizing allow students to get all of their ideas down on paper before beginning the writing of a composition. Two examples of such programs are [Inspiration](#) and [Coggle](#).
- **Word processors with spell check and thesaurus options** have, additionally, been proven to alleviate writing demands on students. A study by Cullen, Richards, and Frank in 2008 found that word processors had a positive impact on written output by students with mild learning differences. Most computers today have the ability to use word-processing programs (such as Microsoft Word) or cloud-based word-processing (such as Google Drive) that include spell check and thesaurus options.

Typing



Research: For some students who struggle with written output, typing can also be a daunting process. This difficulty most often presents itself with students who have low processing speeds and/or have never been taught keyboarding skills. Despite the fact that word processors have been proven to improve written output for many students with learning differences, this process can be equally frustrating for students who type slowly. Therefore, for these students, their “best essays [can be] produced when dictating to a scribe” (MacArthur, 2004).

Typing Programs: One great option for students who might benefit from a scribe is speech-to-text. Similar to text-to-speech, many devices have this built in capability under the “accessibility” features. This option will allow students to speak into their device while the device transfers their oral expression into written text. A specific speech-to-text option available for purchase is [Dragon Dictation software](#).

HOW DOES THIS CONNECT TO USING MULTIPLE MODALITIES?

It is clear that not all learners are the same, even those with similar profiles. By using multiple modalities to allow students to receive and present information, teachers can ensure that each student is given the opportunity to learn, grow, and achieve success in academic settings. The Strategic Network of the [Universal Design for Learning](#) highlights this principle. Technology is simply one potential tool for allowing students to engage with content, especially for students whose skill set inhibits this ability.