Dyslexia and Additional Academic Language Learning

Module 9

Assistive Technology

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Dyslang Module 9 – Assistive Technology
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Disclaimer
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About this module
This is the ninth module of the Dyslang course for supporting the dyslexic multilingual individual, particularly in the context of learning additional languages. It is designed to be usable as a standalone unit that may be shared with a wider audience, especially the learner. However, it may be more understandable to those supporting the dyslexic pupil if read in conjunction with the preceding modules.

This module has been designed to empower not only the teacher but also to provide a resource that can be shared with parents and pupils. For this reason, wherever possible, the text has been made accessible using the language of the classroom that would be understandable to the wider audience.

Aims and objectives
The purpose of this module is to provide an understanding of how technology can support the dyslexic multilingual individual learning another language to make informed choices about available technology and apply it to the specific needs and context of the learner.

Learning outcomes
By the end of this module you should be able to:
• Understand how technology can support the dyslexic individual.
• Say what assistive technology is available to provide support in the classroom language.
• Know what technology may be available in different languages.
• Identify creative ways to utilise technology and the internet.

Language of illustrations
There is plenty of assistive technology for those working in the English language, but for other languages the support is limited. For this reason, the illustrations in this module have been chosen to highlight software that is known to be available in a language other than English (in this case Polish). A quick search of the internet will tell you if your desired language is available, and how to adjust the software (e.g. menus) to your needs.
Introduction

There are two principal ways in which to discuss technology and its role in helping the multilingual dyslexic individual learning an additional language:
   a) Classification by type of technology
   b) Classification by function.

In general, however, the use of software will depend on local needs, local resources and the skills and creativity of teachers. Therefore, in this module we shall look to identify the key technologies, identify some of their uses, and encourage teachers to explore other teaching and learning methods that can make creative use of the technology.

While this is seen as an independent module, there will be no attempt to repeat all the information that is freely available elsewhere. Reference to further reading, with web links where appropriate, will be found at the end of the chapter.

Remember that technology is a rapidly changing environment, and if something was recommended today, something better may appear tomorrow. So you should always try to ensure you have access to the latest information before you purchase. Wherever possible, free software has been identified.

![Classification by function](image1)

![Classification by software type](image2)
9.1 What is assistive technology?

The internet offers many different definitions of assistive technology (AT), each of which are influenced by the author’s context and beliefs. For example:

The Section 508 Standards for Electronic and Information Technology (United States Access Board, 2000, Subpart A, 1194.4) defines assistive technology as:

“Any item, piece of equipment, or system, whether acquired commercially, modified, or customized, that is commonly used to increase, maintain, or improve functional capabilities of individuals with disabilities.”


The Alliance for Access to Computing Careers (AccessComputing) suggests:

“Assistive technology is technology used by individuals with disabilities in order to perform functions that might otherwise be difficult or impossible.”

(http://www.washington.edu/accesscomputing/what-assistive-technology)

According to the National Dissemination Center for Children with Disabilities, the US Assistive Technology Act (2004), there are two aspects to be considered:

1. Assistive technology devices
2. Assistive technology services

According to their website (http://nichcy.org/laws/ata), software comes under ‘devices’.

Another perspective by the British Assistive Technology Association (BATA) is:

“Assistive technology is any product or service that maintains or improves the ability of individuals with disabilities or impairments to communicate, learn and live independent, fulfilling and productive lives.”

(www.bataonline.org/further-assistive-technology-definition)

**Learning software and assistive technology software**

**Learning software** may be considered to be software that enters the learner’s life, the content is learned, and the software then discarded.

**Assistive technology software** is always needed to access information, and therefore is never discarded.
The lines become blurred when you examine the detail of devices and services. For example, an online text-to-speech website such as RoboBraille (http://www.robobraille.org/introduction-robobraille) is a service inside a browser, where the browser (or software interface) is unrelated to the action. So is it a device, software or a service? The BATA definition above appears to provide a wide enough definition that can encompass future changes. Therefore, this is the guiding definition used here.

9.1.1 Classifications and approaches

As mentioned above, there are two common approaches, based on activities, (e.g. reading, writing, listening, note taking, organisation etc.), and the type of technology (e.g. text-to-speech, speech-to-text, concept mapping, preferences, memory, organisation and time management etc.).

An alternative approach is offered by Gillespie, Best and O’Neill (2012), where they refer to Assistive Technology for Cognition, which may be more appropriate when referring to dyslexia, a cognitive disability. In their view (p1), “Assistive technologies for cognition (ATC) can be defined as any technology which assists cognitive function during task performance.” Gillespie et al. use the WHO International Classification of Functioning, Disability and Health (ICF) to categorize the cognitive domains being assisted and the tasks being performed. The cognitive functions specifically addressed are related to attention, calculation, emotion, experience of self, higher level cognitive functions (planning and time management) and memory. If the additional cognitive difficulties identified in dyslexia were added, then the most common assistive technologies used in this field could be added within this framework.

Principal assistive technologies

Although there are many new services appearing on a regular basis, particularly online services, there is a relatively limited set of functions they perform and few categories of assistive technology. (See for example, Smythe, 2010.)

Note that while other similar articles may offer many screen shots, they are often with respect to a single language. Here the linguistic diversity is more complex, and while the focus may be on the additional language being learned, some of the software may be preferred in the student’s first language or in the language of the classroom. Where possible, recommendations will be made which are available in a wide range of languages, or where the software has few translation needs. However, for details, check the websites quoted for the latest language versions.
9.2 Text-to-speech

9.2.1 Introduction

Given that reading difficulty is one of the two symptoms that appears in most definitions of dyslexia (the other being writing difficulty), anything that will help in that task can be seen as a major advantage. It does not matter if the dyslexic individual is monolingual, multilingual or learning additional languages, at some level reading will be problematic. Therefore, a tool that converts the written word into the spoken word will assist some users in the learning process.

Text-to-speech software, which converts written text into human-like speech, can assist in many ways, and the role this technology can play is limited only by the imagination. There is an increasing diversity of systems available, from within browser types to those used on smart phones.

9.2.2 Types of activities

There are many ways in which you can use this technology and those listed below only give a brief introduction to their general use. In the area of language learning, there are many creative ways text-to-speech may be used.

- Reading online and offline e-books and web pages
- Reading electronic documents (Word, PDF, etc.)
- Proofreading one’s own work
- Checking pronunciation of a word or phrase
- Reading as you type at the sentence, word or even letter-by-letter level
- Reading email and chat
- Hearing how to pronounce any word in any language, listening to complete sentences or articles.

9.2.3 Types of text-to-speech (TTS) tools

Text-to-speech software consists of two parts - the “engine” and the “voice”. The engine accepts the text and controls the voice. In commercial applications the two are usually integrated. However, there are some engines that are free (e.g. Balabolka) which can be used with any voice.

On Reflection Task 9.1

Try to think of some activities where text-to-speech software could be used in an exercise that is not possible in other ways.
Although the main tools have been reviewed elsewhere (Smythe, 2010), it is worth considering the different types of engine that may be used with particular reference to the diversity of languages that may be encountered in this context. The principal ones are:

1. **Toolbars (fixed and floating)**
2. **Standalone cut and paste**
3. **Embedded talking tools**
4. **Online tools**
5. **Apps (applications)**

**Text-to-speech “systems”**
Many commercial (and to a lesser extent free) text-to-speech software packages comprise not only the basic voice and engine, but also related functionality, including optical character recognition (to convert scans to accessible text), options of preferences (speed, colour and voice), and the possibility of output to mp3 files. The last of these makes it easy to listen to information on a smart phone away from the classroom.
Types of text-to-speech

1. Toolbars (fixed and floating)
   Toolbar types, as their name suggests, offer floating toolbars that are usually designed to work with most of the common software programmes, such as Office and web browsers.

   Examples include Claroread and TextHelp.

   Some companies also offer a USB version which allows the software to be moved between computers.

2. Standalone cut and paste
   For these you need to work within the software environment, either cutting and pasting from other environments, such as a Word document or a browser, or typing directly into them. The big advantage is that many are free, and can be used with high quality, low cost (starting around €30) voices.

   One of the most popular is Balabolka.

3. Embedded talking tools
   These come in various forms, including:
   - Web page embedded (e.g. Browsealoud, RocTalk)
   - Within documents (e.g. Adobe Read Out Loud in PDFs)

4. Online text-to-speech
   These are becoming more widespread as the technology becomes more widely available and cheaper. Services range from talking text to downloading mp3 files. Most are restricted in the amount of information they will process in one go. Examples include:
   - Google Translate
   - IMTranslator
   - SitePal
   - RoboBraille

5. Apps
   Included within the smart phone revolution is text-to-speech software, making this available on the go, anywhere. Wide availability and take-up have ensured low costs and an increasing number of supported languages.
9.2.4 Voice choice

Table 1 provides a list of the major voices currently available. As with other technologies, it is important to decide what the purpose of the tool should be. It is too easy to become lost in the technology, especially in a situation where there will be at least three languages involved!

Text-to-speech voices

<table>
<thead>
<tr>
<th>Language</th>
<th>Microsoft</th>
<th>Cereproc</th>
<th>Ivona</th>
<th>Realspeak</th>
<th>Google</th>
<th>Robo-Braille</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arabic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Bulgarian</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinese - Cantonese</td>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinese - Mandarin</td>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Czech</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Danish</td>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Dutch</td>
<td>Yes</td>
<td></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>English</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Finnish</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>French</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>German</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Greek</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Hindi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Icelandic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>(Poor)</td>
</tr>
<tr>
<td>Italian</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Japanese</td>
<td></td>
<td></td>
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<td>Yes</td>
<td></td>
<td></td>
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<tr>
<td>Korean</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
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<tr>
<td>Norwegian</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Polish</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Portuguese</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Romanian</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>(Poor)</td>
</tr>
<tr>
<td>Russian</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Spanish</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Swedish</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
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<tr>
<td>Thai</td>
<td></td>
<td></td>
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<td></td>
<td>Yes</td>
<td></td>
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<tr>
<td>Turkish</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Vietnamese</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(Poor)</td>
</tr>
<tr>
<td>Welsh</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Yes</td>
<td>(Poor)</td>
</tr>
</tbody>
</table>
9.3 Speech-to-text (STT)

9.3.1 Introduction

Speech-to-text software allows the user to speak into a microphone and have their words appear on the screen.

While much is written about the use of speech-to-text in books and articles about English dyslexic individuals, there has not been, at least until recently, much support in other languages. However, with the rapid changes in the use of technology, such as iPads, iPhones, phablets and other mobile computing options, the number of languages where speech-to-text is available has rapidly increased. Currently (Nov 2013) Nuance have more than 40 languages available in the Apple store, for use on iPads and iPhones.

Unfortunately high development costs mean that despite speech-to-text word processing software being around for a long time, the number of languages for which it is available is still very few. The key player is Nuance, with Dragon Naturally Speaking, available in English, French, Spanish, German, Italian and Dutch. A search through the internet will reveal a number of other systems available, usually in transit between a university research tool and a commercial product whose ultimate success will depend on take-up, which in turn depends on ease of use.

For example, the Chinese version is not particularly dyslexia-friendly because, due to the nature of the script, the software frequently requires the full sentence to be dictated in order to decide which character to display, and often requires the user to make informed decisions. Another example is the Polish Skrybot, a low cost solution which still requires training that involves 30 minutes of dictation, with the resultant file being sent to an online server for “set-up processing”. Presumably this is because, unlike Nuance software, there is no processing capability in the software you download and store on your local computer. However, this apparent inconvenience is reflected in the price - around €8 for Skrybot as opposed to over €100 for Nuance software.

Skrybot - A low cost Polish speech-to-text system

Dictate (by Nuance) on the iPhone (Polish version shown)
The latest versions of the Nuance software involve highly sophisticated algorithms which are used to minimise training for the software, to optimise the system to the user’s voice. The latest English version, for example, needs as little as five minutes before you can start using it with good results. However, the quality will depend not only on the amount of training undertaken, but also on how close the match is between the accent of the user and the possible accents available in the software.

Taking the English version for illustration, one can select UK English, American English, Australian English or Asian English. The closer the match, the less training required, and the better the results. However, with appropriate training a wide diversity of accents can be used. Thus it would be possible to retrain the program for, say, a person with a Welsh or Polish accent.

However, lately a small revolution has been taking place, and the situation has rapidly changed, opening the way for many new possibilities.

Two specific developments have occurred: 1) Technological advances have meant that smart phones (led by Apple) can have speech-to-text capability, and 2) Google has entered the marketplace. Both of these have led to the potential for more voices and lower costs.

The change has been possible because the voice is no longer being (fully) processed locally on your device, but sent online to central data processing. The downside is that it relies on the rapid transfer of your sound file: it can be tiring constantly waiting for your words to be transmitted, processed and returned, and then to check on the small screen. However, with massive processing power online, there is greater potential to combine many people’s voices with diverse accents in a way that improves quality and reduces the need for training. However, this can only be beneficial to the individual if the system knows who is speaking. With Google, there is no registration or login. Therefore the potential to personalise it for a given person is restricted.

**Google dictation**

With its huge international resources, Google has been able to make significant inroads into the field of speech-to-text. Being an early pioneer of smart phone use, and now with Google Translate, Google offers a diversity of speech-to-text opportunities.
9.3.2 Possible activities

Given these limitations (in particular the need for a possibly lengthy training period before starting) it may seem surprising that so many dyslexic individuals use it. However, remember that if you have gone through education with very little opportunity to express yourself in writing, to have to spend 30 minutes on dictation may be worth the reward. That said, it would usually be recommended that somebody is available to “coach” the reader during this training session. Also, it may be helpful to pre-record the training material, using software such as Audacity to remove any hesitations or mispronunciations.

There are many potential uses for this software, and it is for the teacher to work with the pupil to find ways it could help. However, it is important to monitor the use, remembering that the system is designed to be trainable and adapt to the user’s voice. Checking pronunciation of the target language may appear to be a good activity, with the pupil practising the words to be learnt and noting if they are displayed correctly on the screen. However the potential for this activity may be limited as the software can adapt itself to accept the individual’s accent, displaying the words correctly and leading the pupil to believe their pronunciation is improving.

There is little doubt that the quiet revolution led by Apple and Google, and beginning to appear in Android devices, will reap significant benefits for dyslexic users in the coming years.

However, just because the speech-to-text may exist in a given language does not in itself mean it will be useful, and indeed in most cases it is of limited use. Probably the most useful application would be when searching for material in the first language of the dyslexic user. That may be useful in many lessons, but would not be considered to be part of the language learning process.

It is important to pay attention to what is referred to as the training phase of speech-to-text. The latest STT versions for mobile phones and normal computers have very sophisticated algorithms which allow multiple users with little training. (Don’t believe what they show on the adverts! Those examples are not straight out of the box.) The problem is that they only work well if the developer’s algorithm for a “standard” voice is close to the voice/accent of the user. And the further the user’s accent is from the standard, the more training will be needed and the more errors will occur.

However, trials have shown you can re-train at least the computer-based version of speech-to-text even if the accent is some way from the original. The catch is that the verification process means comparing what the software thinks you said to what you actually said. Which means reading!

Teachers should explore the potential of STT, and seek to identify creative uses.
9.4 Concept mapping

9.4.1 Introduction

As discussed in earlier modules, concept mapping is a very useful tool for the dyslexic individual. Since details have already been provided in Module 7 on how to create them, the focus here will be to identify what could be useful for any given user. (See Links and further reading for International Concept Mapping conference papers, which may provide inspiration.)

The software available can be classified into three main groups:
- Offline
- Online
- Mobile

Within each of these there are subgroups such as free and commercial. The emphasis here will be on the free and open source versions, since nowadays they cover most of the functions previously restricted to commercial versions.

9.4.2 Offline, online and mobile - pros and cons

In concept mapping functionality, there is not much to choose between many of the packages. However, it can be important to consider how the software may be used from a technical perspective.

Offline is the obvious choice when internet connection is poor. There are a number of options, such as XMind, which has good functionality at no cost. An internal open source development community ensures plenty of support. The problem is what happens when your computer does not travel with you. It would mean that you need to always ensure that you have copied the concept maps to a USB device, and that the correct software is installed on the next computer you visit. This may not always be an option in school.

Using online systems means that you can access your work anywhere, provided you have a good connection. It also has the advantage of never requiring updates (since the online version is always the latest), and often has access to larger libraries. Internet speed will probably be the deciding factor.

Only a short while ago, “mobile” referred to mobile phones. However, with the distinction being blurred between phones and tablets, any reference to mobile should cover the diversity that is now available and will be in the near future.
Currently concept mapping on a smart phone tends to be more curiosity than a working reality, due to the small size. Methods of scrolling around the work surface have been used, but usually, unless you can see the whole map at once where you can read everything clearly, much of the advantage of using a concept map is lost. This may change as the mobile interface becomes bigger and more commonplace.

**9.4.3 Which language should be used?**

In our language learning context, there are at least three languages which can be considered for concept mapping:

- The language of the school
- The pupil’s first language/s
- The additional language/s being learned

There is no correct answer as to what language should be used in a particular concept map as it will be context-dependent. It will depend largely upon the skills of the user at any one time, and the purpose of that piece of learning. Although there is always encouragement to use the “target language”, that is not always the answer for the dyslexic language learner, and their preference should be considered, with any compromise being in relation to the learner’s needs.

For example, at different stages, the individual may produce a concept map in their first language, work with one teacher to ensure the “language of the school” version is correct, and then complete a task in the language being studied.

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**Non-specialist software**

It would be easy to find excuses for not using concept maps, such as cost or lack of availability in a given language. However, there is no reason why they could not be made in widely available software. The two concept maps below were developed using Microsoft PowerPoint.
Compare and contrast

Below are two free concept mapping tools, and brief descriptions that help identify the key areas to consider when making choices. Note that just because there appear to be certain advantages for a given tool does not mean that it will be preferred by a given individual.

**XMind**
- Type: Standalone, computer based
- Picture library: Yes
- Word output: Yes
- Menu items: Many
- Time to explore interface: Long
- Different language versions: Yes
- Price: Free
- Web address: www.xmind.net/
- Notes: Well supported in English

**Ikonmap**
- Type: Online
- Picture library: No
- Word output: Yes
- Menu items: Few
- Time to explore interface: Short
- Language version: Nothing to translate
- Price: Free
- Web address: www.ikonmap.com
- Notes: A few bugs (saving repeatedly overcomes most bugs)

On Reflection Task 9.2

Above are two examples of concept mapping. Try them both, and then consider which type you would allocate to which of your dyslexic and non-dyslexic students, and why?
Concept maps with different language menus

Below are two concept maps that are simple to use, have few distracting menus and are available in different languages. They are:

b) Blumind - http://blumind.org/

MindHD is one of many concept mapping tools available on smart phones. The small space means often menus are limited, which can be an advantage for dyslexic individuals, and means language issues are minimised.
9.5 Preferences

9.5.1 Introduction

The aim when setting preferences for reading and writing is to reduce any visual stress the individual may experience and to present material in the optimum manner for them. It is always possible that a dyslexic individual may not be aware of what would suit them best. The intention here is to highlight some of the areas that should be considered and to show how technology can be used to adjust the way material is presented.

9.5.2 Typography

If text is available in electronic format, why accept it the way it is presented? Microsoft Word (and Open Office) have the capability to control all the features to make reading “optimised”. This includes changing:

- Typeface - e.g. from Times to Comic Sans
- Font size - e.g. from 9pt to 12pt
- Line spacing - e.g. from 1 line to 1.5 lines.

Research with non-dyslexic individuals and discussion with dyslexic individuals suggests that while everybody is different, the second of each choice given above is preferred by many.

Compare and contrast

Below are two panels of text. The left hand side uses a white screen and Times typeface. The right hand side uses Comic Sans and a pastel coloured background. Many dyslexic (and non-dyslexic) individuals prefer the right hand side. But few take the time to make changes.

On Reflection Task 9.3

Try printing on different coloured backgrounds and asking teachers and pupils what their preferences are. Also try varying the typeface, maybe with several different examples on one page.
9.5.3 Colours

Changing colours

Bright lights, strong background and inappropriate colour combinations can all cause reading difficulties for the dyslexic individual. However, there are many ways that one can relieve this form of visual stress. Some of them are shown here. (See Links and further reading for downloadable software.)

Microsoft Word
Programmes such as Microsoft Office have many options including changing the background and text colours. These are easily accessible, and some time should be spent on finding the best combination.

Coloured overlays
There are a number of free and commercial versions available. These can be placed over the top of any text you wish to read. However, not all of them allow typing in the coloured areas.

PDF Colours
Programs such as Adobe Acrobat allow the background colour to be changed. By setting the colours on one document, the same settings will be held for other documents.

Highlighting
Colour can also be used for highlighting words or phrases, allowing the eye to jump between key parts of the text.

Browser background colour
It is generally possible to change the background colours of web pages although not all browsers have built in capability to change background colours and there has been a recent trend of designers not allowing browser access to make changes. However, there is usually a plug-in that can do it.
9.6 Memory, organisation and time management

9.6.1 Introduction

Memory underpins many of the difficulties faced by the dyslexic individual, from spelling to organisation and time management, including preparing for exams. However, those difficulties are covered elsewhere, both within the Dyslang modules, and in resources to be found on the internet. The intention here is simply to highlight some of the many tools that may be useful for the multilingual dyslexic individual.

9.6.2 Types of reminders

There are many types of software designed to support one or more types of memory issues. Most can be classified in one of the following sections:

- Short term needs (e.g. shopping lists)
- Long term needs (e.g. to do lists)
- Time dependent (e.g. birthdays)
- High stakes (e.g. password protection)
- Composite (e.g. exam revision)

(N.B. This is only a rough classification since many memory requirements may be related to more than one area.)

Although not directly related to language learning, the dyslexic learner will have issues with all these areas, and technology could offer useful support, irrespective of their language needs.

Apps to aid memory

There are thousands of apps now available for iPhone and Android devices in many languages. Below are just three - for shopping lists, general reminders and calendars with alarms.
Passwords

Storing passwords is not normally seen as a tool to review with respect to language learning. But if much of your work is carried out online, with access by usernames and passwords, then the dyslexic individual will be significantly disadvantaged by a poor memory.

9.6.3 Online organisers and planners

Until recently, computer-based reminders (widgets and apps) were the main option. However, a plethora of online services, as well as smart phone functions and downloadable apps mean there are now many options.

Examples of online services that send out reminders include:
- www.memotome.com
- www.rememberthemilk.com
- www.remindeo.com
- www.hassleme.co.uk
- www.timerrr.com

Smart phones usually come supplied with alarms, note areas (sometimes referred to as Memos and Tasks), digital recorders, calendars, timers and stop watches, all of which can find a place in supporting the memory of the dyslexic learner when used creatively.
9.6.4 Memory and learning tools

Although learning tools, as discussed at the beginning of this module, should not be considered as assistive technology, if they are used as engines to propel the individual’s learning forward, then there is logic in at least mentioning what is possible.

There are many types of games online that can be used to practise spoken and written vocabulary, either as simple Flash Card types or as game-like activities. Free and commercial examples include:

- www.quizlet.com
- www.audioflashcardsonline.com
- www.internetpolyglot.com
- www.remembr.it
- www.surfacelanguages.com
- www.caldys2.eu
9.7 Other uses of assistive technology

9.7.1 Spelling and grammar

Many individuals may not have so many problems at the single word level, but struggle with grammar. Software such as Microsoft Word and Open Office have grammar checkers in diverse languages. (N.B. The Microsoft version is not always free.) However, we often take certain things for granted, such as where to find the spellchecker and grammar checker.

For those learning English, there are a number of free and commercial options online. These include:

- Grammarly - www.grammarly.com
- SpellCheckerPlus - www.spellcheckerplus.com
- Ginger - www.gingersoftware.com
- PaperRater - www.paperrater.com

A quick search with Google will find other language specific examples.

French:
http://www.reverso.net/spell-checker/french-spelling-grammar/
http://bonpatron.com/en/

Welsh:

German:
http://de.spellcheck.cc/

Several different languages:
http://www.languagetool.org/

Developing word lists

In certain circumstances it may be advantageous to have a list of the most frequently used words and phrases. There are a number of online services, of which this is one of the best.
9.7.2 Translation

The purpose of this section is to highlight what is available, rather than take a view on whether or not it should be used. But without doubt, while most would agree about the advantages of a second language, many dyslexic individuals will only survive the language learning part of school if they can find useful strategies that help them overcome any difficulties they may have. Computer translation of text is one area that many dyslexic individuals will explore.

Over the past few years, the dominant force in online translation has been Google, though Bing is trying to make a fight of it. With millions of dollars at their disposal, they can invest money into major and minor languages, and although not perfect, can produce a translation which, as far as many dyslexic individuals are concerned, will be good enough to help them with their homework.

Bing - www.bing.com/translate
Google - http://translate.google.com
ImTranslator - www.imtranslator.com

Note that Google has text-to-speech in many languages built into their translation page. ImTranslator also has virtual keyboard, spellcheckers and text-to-speech in certain languages.

While there are others, they do not seem to be able to maintain the same high quality as these.

9.7.3 Recording

Many dyslexic students find it difficult to follow classes and turn to technology to help. Simple sound recording devices, such as the smartphone, can be very helpful, as well as the standalone digital recorder. However, it may sometimes be important to remove all the unwanted parts of the recording, such as long pauses and irrelevant discussions. There is plenty of good software out there to assist, of which Audacity is the most popular. This is also available in many languages.

Audio recording and editing software “Audacity”
As well as audio recording, some students (and teachers) also like to use video recording. Again, the editing can be very important. Free online resources such as Ezvid can be very useful to help focus the learning.

Online video editing software “Ezvid”
9.8 Assistive hardware

A number of handheld devices can be used to scan the text to provide a translation. Examples include:

- Quicktionary
- InfoScan
- ReadingPen + Portable scanning translator

There are an increasing number of translation tools that are designed for the mobile phone, in particular for text used in communications such as email, SMS and instant messaging. Furthermore, an internet search will produce many mobile dictionaries.
9.9 Conclusion

Technology is not the panacea that some people imagine it to be for all the difficulties faced by dyslexic multilingual individuals. The technology is there, and there is no doubt that it can help. But it seems we are in a Catch-22 situation:

> How can we know its potential if we do not use it creatively?
> How can we use it creatively, if we do not know its potential?

With more idea of what can be done, assistive technology opens itself to more exploration, and alternative technology can be sought if it turns out that the original piece doesn’t meet the needs of a particular individual.

However, it is wise to keep in mind that the most complex piece of software or technology isn’t always the most useful. At times it is advantageous to seek out simple software which helps focus on and deliver the task in hand rather than opt for one with many different functions.

Smythe (2010) revisited Nichols (2003) “Theory of e-learning”, updating it in a way that, arguably, is relevant here. Specifically, two of the ten hypotheses are:

**Hypothesis 3**
The choice of e-learning tools, including assistive technology, should reflect rather than determine the pedagogy of a course; how the technology is used is often more important than which technology is used.

Put another way, there are many functions of assistive technology that could benefit the multilingual dyslexic individual if only they were aware of their existence. And if they are aware of their existence, how often are they capable of reading through the instruction manual to get the best use out of them?

**Hypothesis 5**
E-learning can be used in two major ways: the presentation of educational content, and the facilitation of educational processes.

Both aspects involve the way information is accessed, which is key to learning for dyslexic individuals. It involves not only the user interface but also integration of multimedia into the overall structure.

Only as we start to really understand the technology and its capabilities will we start to be able to effectively support the dyslexic multilingual individual.
References


Assistive technology and software


Browsealoud http://www.browsealoud.co.uk/ [Last accessed 23/11/2013]


IMTranslator http://text-to-speech.imtranslator.net/ [Last accessed 23/11/2013]

InfoScan http://www.scanningpens.co.uk/line-scanners.php [Last accessed 24/11/2013]


Module 9 - Assistive Technology


**Links and further reading**

**Additional software**


**Useful websites**

There is no one website that covers everything but each of these offers resources (mostly free) that may be of use.


**Centre for Learning and Performance Technologies** – featured resources include the Top 100 Tools for Learning 2011, a Directory of Learning & Performance Tools that contain over 2,000 items, links to articles and resources produced by Jane Hart, Jane’s Pick of the Day and Jane’s Social Learning Handbook. [http://c4lpt.co.uk/](http://c4lpt.co.uk/) [Last accessed 24/11/2013]


**ICT for Language Teachers** - this is a privately run website, based on a European project site, with links to many resources. [http://www.ict4lt.org/](http://www.ict4lt.org/) [Last accessed 24/11/2013]
Integrating ICT into the MFL classroom - in this blog, Joe Dale offers many general (i.e. not dyslexia-specific) practical tips and advice on using ICT to enhance the teaching of modern foreign languages. http://joedale.typepad.com/ [Last accessed 24/11/2013]


Languages without limits - developed from Hilary McColl’s website on language learning and inclusion - http://www.languageswithoutlimits.co.uk/ [Last accessed 24/11/2013]


Specialist dyslexia suppliers

iansyst - http://www.iansyst.co.uk/dyslexic

Microlink - http://www.microlinkpc.com/education