Computers and Assistive Technology

General Benefits and Advice

Developments in computers and assistive technology have been of great benefit to all students, and in particular, provide essential and significant help to students with dyslexia.

Computer programmes can be used to assist in the learning process. While there is no substitute for individual tuition from a trained teacher, computer programmes provide valuable reinforcement, variety and can increase motivation. There are hundreds of programmes available which can be used to practice reading, word attack skills, spelling and maths; there are also many assistive programmes which enable learners to access material, while others support writing and learning.

With so many programmes and products available, it is easy to become confused with the choice. Computer software can be expensive and comes packaged, so it can be difficult to find out prior to purchase if a product is suitable. Ways of obtaining practical experience of the software include advice from other teachers and demonstrations of software at conferences or exhibitions. It can sometimes be possible to get a free 30-day demo or trial disks from suppliers or download them from the internet. Ideally, the teacher, parent and most importantly the intended user should be involved in the process.

It is now nearly always possible to find demonstration videos online for virtually any piece of equipment, software or app. It is always worth checking if the makers of the product have demo videos on their website or a YouTube channel. If not, you will almost certainly be able to find a video just by searching for the product name on YouTube.

Assistive Technology Grant

Currently, for primary or second-level students with significant dyslexia, whose literacy skills are at the 2nd percentile or lower, the school can apply to the SENO for a computer/laptop and any specialist software needed by the individual student. The psychologist's report must state that this equipment is essential for the student throughout the school day, and how it will be used.

If a computer and/or software is bought by parents or an individual for home/personal use, the VAT can be claimed back, using Form VAT 61A, from the VAT Repayments Section Tel. 047 81425. The form can be downloaded online from www.revenue.ie.

Simple Low-Cost Uses

It can be very helpful if teachers provide students with **clear typed or word-processed notes** rather than handwritten ones. Type should be clear and well separated, using a minimum of size 12 or 14. Sans serif fonts are best, e.g. Arial, and Comic Sans, Verdana, Helvetica, and Tahoma. Use lower case or sentence case, as using all capitals can make it harder to read.

Some people with dyslexia will benefit from the information being photocopied or printed onto **coloured paper**. Some people find that they get less glare or experience less visual stress when using colours. Some individuals use **coloured overlays**, which they place over the textbook. It is also possible to change the font colour and background colour on the computer.

Colour coding key information can aid memory; using different coloured highlighters, or colour coding in documents, should be encouraged. Provision of **visual information** can be very beneficial for some learners; include **pictures, diagrams, charts and mind-maps**.

Some material is available on CD, **audiobook or digital book format**, particularly English novels, drama and even some poetry. This can be accessed through most good bookshops, libraries or online. **OverDrive** and **Borrow Box** are two apps for tablets and smartphones which allows borrowing of digital and audiobooks from local libraries. **www.audible.co.uk** is a subscription service for high-quality audiobooks. There are also numerous websites where cheap or free digital copies of novels can be downloaded, such as www.epubbooks.com**.** DVDs may also be available where novels or dramas have been filmed. These would all be good interactive learning tools.

Bookshare Ireland is the largest accessible digital library in Ireland and is available for free for individuals with dyslexia. Members can access Bookshare Ireland using their desktop computer, tablet or smartphone by signing up at www.bookshare.ie

Some students may benefit from **recording** lectures, or even recording their own study notes. They can build up their own audio library which they can then use for revision. An MP3 player or smartphone can be used so that the student can listen to their class or study notes while travelling on the bus. There are also numerous apps for tablets and smartphones that would allow students to record their own notes.

An electronic dictionary is an inexpensive, portable tool for checking spelling, e.g. **Franklin Spellmaster** or **Collins Electronic Dictionary and Thesaurus**. As long as the individual can make a reasonable phonetic attempt, there is a good chance that the correct spelling can be identified. Some electronic dictionaries also have a thesaurus feature which can help with expanding vocabulary. There is also an app called **Dictionary,** which is available for Apple and Android products, that allows the user to either type or speak a word in order to search for it. The app can then give the correct pronunciation, spelling and synonyms.

Portable Devices

Tablets and **smartphones** can now be extremely useful tools for people with dyslexia. Many tablets and smartphones come with in-built screen reading and voice recognition features, and there is a vast range of apps available for all platforms to assist with reading, writing, spelling, organisation, study skills and numeracy. There are also apps for OCR, so that printed text can be captured and read out.

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For those students whose reading is reasonably competent, but where they come across occasional words that they cannot identify, a **reading pen** can be a good solution. These are handheld pens containing OCR software which enables them to scan and read words and phrases; they also include a dictionary to explain what a word means.

Electronic readers such as Kindle, Sony eReader and others have opened up the world of digital books. Some are more basic than others. The Kindle Fire has an in-built screen reader.

Mobile versions of software are also now available. Some software can be purchased as a USB key, meaning that the software travels with you and you can use it on any computer, at home, work or in the library, rather than just having your software on one machine in one location.

Developing Keyboard/Typing Skills

Computer literacy is a skill for life, and to be able to use a word processor effectively all students should learn to touch type properly. It does take time and effort but it is well worth it, and best to start early, before any bad habits develop. Regular practice is the key, and there is a wide range of typing tutor programmes available for all ages, e.g. **Nessy Fingers, Type to Learn**, **Englishtype Junior and Senior**, **Touch Type Read Spell** and **Mavis Beacon**. If the use of a word processor helps students to achieve, they should be able to produce homework, projects and house exams in this way.

The reasonable accommodations allowed in state and college examinations include the use of a word processor for some students. If a school or college is to assess whether a student would benefit from using a word processor in examinations, the student needs to be proficient in its use.

It is never too late to learn how to type correctly. Adults of all ages can learn to touch type, but like with most learning, the earlier it is done the better.

Developing Literacy Skills

There are hundreds of excellent programmes available which support the development of basic skills in reading, phonics and spelling. However, it must be remembered that no computer programme is a substitute for individualised specialist teaching. Many programmes will also come in a range of different levels; it is important to choose the right level for each individual. Catalogues of educational software can be obtained from many of the specialist suppliers listed at the end of this section. The programmes mentioned below are examples of the types commonly used.

There are many literacy programmes available which provide a useful learning aid to practice and develop reading, phonics, spelling, etc. Especially for younger readers, there is a wide selection of talking books available, e.g. the **Wellington Square** and **Oxford Reading Tree** schemes.

Wordshark, based on the 'Alpha to Omega' programme, combines the excitement of computer games with learning to spell and read. It offers 41 games that use sound, graphics and text to teach and reinforce word recognition and spelling. New words and vocabularies can also be added.

The **Lexia** reading series helps students to strengthen skills through interactive exercises working on areas such as phonemic awareness, decoding skills and comprehension.
Starspell helps develop spelling skills from younger children to adults. It uses the Look-Cover-Write-Check strategy. Every word is spoken and many have pictures. It is also possible to create personal word lists and subject-specific vocabularies.

Nessy Reading Spelling is designed to reinforce spelling, reading and listening skills in a multi-sensory way. Nessy Learning also has a wide range of apps available for tablets and smartphones, such as **Hairy Letters, Hairy Phonics** and **Hairy Words.** These are fun, multi-sensory games for helping with the development of reading and spelling skills.

My Reading Coach offers a comprehensive reading programme aimed at phonemic awareness, pronunciation, word building skills, grammar and reading comprehension. After an initial test, it sets out an individual programme for a child, focusing on the areas that need development. It builds in lots of repetition and reinforcement, as well as monitor progress.

There are many other programmes which target specific areas, such as reading comprehension and cloze procedures, auditory discrimination and phonics, the magic 'e' rule, etc. These can be useful motivational tools to reinforce learning.

Developing Numeracy Skills

Some people with dyslexia have problems with numeracy also. For some their difficulties are due to the literacy of maths, difficulty recalling tables or maths facts due to memory difficulties, or sometimes confusion of maths symbols. However, some individuals have dyscalculia, a specific learning difficulty with maths, which affects their number sense and ability to grasp

mathematical concepts. Concrete learning is very important but software can help some individuals also.

Maths software programmes provide an opportunity to practice arithmetic skills and reinforce maths concepts. **Numbershark**, **NumberGym**, **MathBase**, **Mathmania**, the **BBC Maths Workshop Series**, and the **Maths Circus** Series are all useful programmes. **Mathpad, MathPaper** and **MathBoard** are three examples of numeracy apps.

Learning how to use a calculator and simple spreadsheets can also aid the performance of calculations. Calculation applications on mobile phones can also be very useful.

Learning tables can be particularly challenging for people with dyslexia as it involves memory and sequencing, areas which are often weak. Tables to music are available commercially – these can help some students. Software programmes to help learn tables are also available, both for computer and as mobile phone apps.

Access to Text

For students with reading difficulties, accessing curriculum textbooks can be very difficult and time-consuming. For those students whose reading is reasonably competent, but where they come across occasional words that they cannot identify, a reading pen can be a good solution. These are handheld pens containing OCR software which enables them to scan and read words and phrases; they also include a dictionary to explain what a word means. **Wizcom** is one company that make these pens. There are also lots of OCR apps for tablets and smartphones – **App Writer**, which is available for Apple and Android, is one example.

Students who have more significant reading difficulty may need to go for a complete text-to-speech option, using screen reading software. Screen reading software will read any text on the computer screen, whether it is text which the student has just typed, an email or webpage, or pages of a textbook which have been scanned into the computer. When used together a scanner and screen reading package can make even very slow readers self-sufficient. The reading voice and reading speed can be adjusted; words can be read word-by-word, in sentences or continuous passages. Text scanned in can be converted to an audio file format and downloaded onto an MP3 player to be listened to later.

Examples of this type of screen reading programme are **ClaroRead**, **Kurzweil** and **TextHelp Read & Write**. ClaroRead and TextHELP have additional features supporting the production of written work, e.g. talking spell checker, homophone checkers and predictive typing. ClaroRead works closely alongside Dragon Dictate (see below) resulting in seamless dictation and proofreading of the text. Mobile versions of this type of software are now becoming available (the programme comes on a USB drive); this means that the student can carry the software with them and use it on any compatible computer.

There are also various free and low-cost options for screen reading. **WordTalk** is a free plug-in for Microsoft Word that reads out text and also has a talking dictionary feature. Many PDFs have an in-built screen reader, which can be activated by going to 'View' and then selecting 'Read Out Loud'.

Most tablets and smartphones now have in-built screen reading features. These can usually be activated by going into the Accessibility menu. iPads, for example, have two options, Speak Select and Speak Screen. Speak Select allows a small section of the text, or individual words, to be highlighted and then spoken whilst Speak Screen reads the entire screen out. There are also many apps available such as **Voice Dream** for Apple and **IVONA Text-to-Speech** for Android.

Digital versions of textbooks are often not available commercially, but it is always worth contacting the publishers to see if they can provide a digital version of the content. The move to digital books will be a great benefit to people with dyslexia and others as it is making digital content much more accessible.

Writing Support

Access to even a basic word processing programme can be helpful, and a student with dyslexia will produce better work on a computer than if they were handwriting. The computer will always produce clear legible writing, whereas handwriting may be difficult to read. Spelling can be checked using the spellchecker. Editing and rearranging text is easy, so students do not have to rewrite laboriously to produce a final draft. This facility also helps students who have sequencing difficulties as it is easy to edit the text so as to rearrange the sequence. Forgotten information can simply be added in later, or a paragraph moved to improve the flow of the passage. The **AutoCorrect** feature in Microsoft Word is a very useful tool that is often underutilised. It can be customised so that the individual can build up their own bank of commonly misspelt words.

Screen readers are also a very useful tool for supporting writing. They allow the student to hear any errors, e.g. a mistyped word, or an incomplete sentence. **WordTalk** is a free text-to-speech plugin for Microsoft Word which also includes a talking spellchecker.

Commercial software packages such as **Ghotit, Ginger, ClaroRead** and **TextHELP Read&Write** have a range of features such as homophone checkers, word prediction and phonetic spellcheckers. They also have more sensitive punctuation and grammar checks than would be available on MS Word.

The **Livescribe Echo Smartpen** is another useful tool for capturing information quickly. It digitally records handwritten notes while linking them to simultaneous audio recording, great for taking notes in lectures and meetings. Using a special dotted (digitized) paper, the Livescribe Echo Smartpen will remember everything you write and hear. **Notability** is an audio note-taking app that functions in a very similar way to the Livescribe pen.

Sonocent is a computer programme and smartphone app which captures audio, typed text and PowerPoint slides in a single note-taking workspace. It organizes and categorises note sets so that you can easily return to them and can turn your notes into a variety of formats to suit different learning styles.

Voice recognition software is ideally suited for older students and adults who have to produce extended pieces of written work such as long essays. All instructions can be given verbally; the computer will type as you speak. **Dragon Dictate Naturally Speaking** is the most commonly used programme of this type. While this type of software has improved greatly over the last decade, it will rarely be 100% accurate. There is an initial training period where the programme learns about the user's voice, and the accuracy does improve with usage, as each time the programme is used it learns more about the user's voice, speech patterns and the vocabulary commonly use. A compatible digital voice recorder can be used with Dragon; this means that documents can be created by voice anywhere, and when the digital recorder is synched with the PC, Dragon can then transcribe the document.

Most tablets and smartphones now include in-built voice recognition features, which can be used to write emails and text messages (by pressing the microphone icon beside the spacebar) and also can be used with word processing apps. There are several very low-cost voice recognition apps on the market, with **Voice Dictation** (Apple) and **Olympus Dictation** (Android) being two examples.

Study and Organisation Aids

A very common feature of dyslexia is poor organisation skills, which affects many areas, e.g. time-keeping, planning study timetables, and especially the organisation of information, whether it is making good revision notes or the organisation of longer written passages.

Concept-mapping or mind-mapping software programmes are very useful tools for students who have good visual-spatial ability. Information can be converted into a visual mind-map containing key information, pictures and showing connections. Students can use mind-mapping software to create visual revision aids, but it can also be used for brainstorming, concept mapping and planning essays. **Kidspiration** (for younger students) and **Inspiration** are some of the most commonly used programmes of this type. **Mind Genius** is another good programme for older students and adults in the workplace. There are lots of mind-mapping apps for tablets and smartphones – **Popplet** is one example.

MyStudyBar is a set of portable open source and freeware applications to help dyslexic students with studying, assembled into one package. It includes tools for mind-mapping, customising fonts and background colours, a talking dictionary and text-to-speech features. It is completely free to use.

There are some programmes on the market which may help to improve memory using various interactive activities and games, e.g. **Mastering Memory**. They present sequences of pictures, words and symbols to be remembered, and gradually increase the difficulty level and speed. There are some apps that aim to help improve memory; **Memory Workout** and **Brain School Training** are two examples.

Some older students and adults find using a PDA (Personal Digital Assistant), electronic organiser or their mobile phone applications helpful to keep track of coursework requirements, when an essay or project is due, making to-do lists and study timetables.