Assistive Technology for libraries and shared study spaces

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Introduction

There is a wide range of Assistive Technology which can be used in higher education to increase accessibility. Within this document we will set out which equipment and software should be made available in public access study areas, such as a library, to help ensure the majority of service users, included disabled users, can gain reasonable levels of access. In addition to the equipment which should be available to enable access, we have also included equipment which could be considered, “a gold standard”. This equipment could be seen as moving beyond “basic needs” and towards “consumer choice”. In the guide, you will find:

- Key definitions and introductions to the main categories of Assistive Technology.
- Images and descriptions of equipment and software.
- Information about what is required to meet basic accessibility requirements for shared spaces, and what could be described as representing a gold standard for each category of equipment.
- Approximate costs and links to suppliers.
- Other issues to consider to maximize the effectiveness of Assistive Technology.

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Assistive Technology (Alternative and Adaptive Technology)

Assistive technology refers to any piece of equipment or software, whether acquired commercially, modified, or customized, that is used to increase, maintain, or improve functional capabilities of individuals with disabilities.

We also often use the terminology alternative and adaptive technology.

> **Alternative technology** is equipment or software which performs the same function as the standard option. It will not have been explicitly designed or modified with accessibility for disabled users in mind, but through its design it could be used to better accommodate an individual need. An example would be a compact keyboard, or mind mapping software.
>
> **Adaptive technology** is equipment or software that has been designed, created or modified, specifically to meet the needs of an individual with a disability. An example would be a keyguard for a keyboard, a joystick mouse, or a voice output communication aid (VOCA).

Over the past 25 years, the line between alternative and adaptive technologies has become blurred, as people often find this equipment may be more suitable for their individual needs when compared to standard equipment. This is regardless of disability. Many products which were initially designed to aid the lives of disabled people have gone on to be used primarily by the non-disabled (voice recognition software such as Siri or Google Voice Search is an example of this).

Accessibility Features of Operating Systems

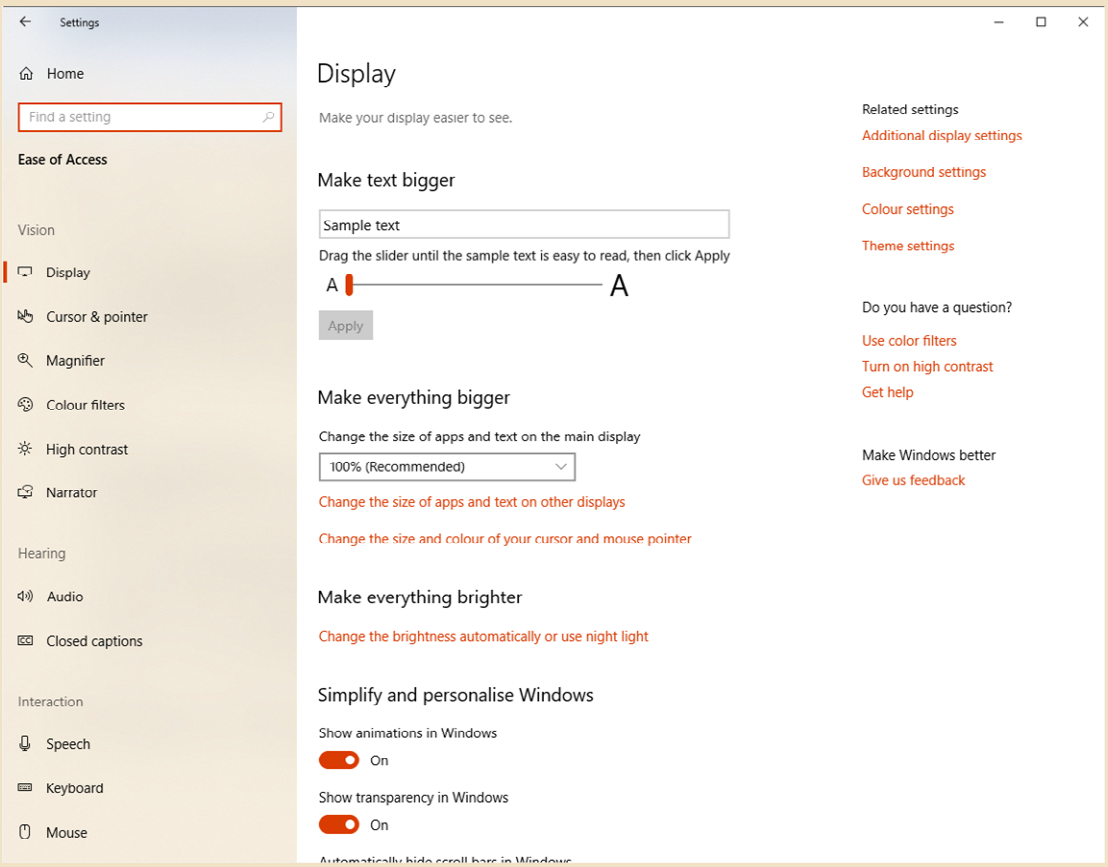
Microsoft Windows, Mac OSX, Apple iOS, Google Chrome and Android all come as standard with a range of assistive features, built in. These are powerful sets of applications which offer a wide range of access solutions for users with physical, sensory and/or cognitive disabilities or difficulties. It is critical that these features are not overlooked in shared study spaces, as they are the foundation of accessibility on standard computer technology. Every device will have some accessibility features, and they are free!

Important: It is fundamental that the accessibility features on public access workstations are not turned off. If you find that any options mentioned in this document are not available in your unit, contact your IT support for guidance. Since the introduction of the Disability Discrimination Act of 1995, which then became the Equalities Act of 2010, it is the responsibility of all service providers to make "reasonable adjustments" for disabled people. Switching off the existing accessibility features is potentially discriminatory as it reduces access to resources that could reasonably have been made accessible.

Staff in Libraries and other shared study spaces should be ready to assist students in using the accessibility features available on workstations.

Windows Ease of Access

The options for Windows Ease of Access can be opened with the hotkey ⊞ + u. You will also find it in the Windows settings options.



Ease of Access features include:

- Tuning keyboard and mouse settings (including Sticky Key, Filter Keys and Toggle Keys). These features can enable one-handed users (or even one-digit users), to access all the features of Windows.
- Switch on an on-screen keyboard (known as the OSK), enabling the use of a computer from a mouse or touch screen only where required.
- Text-to-speech, where the computer will read information back to the user, using the Narrator feature. This is a helpful for features for anyone with a preference for listening over reading, and essential for many people with a print disability.
- High resolution and Night Shift modes. These features enable all aspects of the display to be configured so that the colour pallet is suitable for individual need. The most common high-resolution mode is “high contrast white on black”, which is the default.
- Magnification, where part of the screen is magnified to fill the full screen using the Magnifier feature.
- Voice recognition, where speech is converted into text.

For more information regarding the Windows accessibility features, please refer to the following web page: Microsoft website – make your PC easier to use.

Select this link for a video summarizing what Microsoft are doing to help improve accessibility.

Apple Products

Apple have incorporated accessibility features into all of their products. They maintain a portal on their website dedicated to inform users of what these features are and how they work. View the Apple Accessibility (UK) portal by selecting this link.

Although in the list below we have concentrated on Mac accessibility features, please note that iOS also has a range of powerful features. The iPad in particular can be configured to accommodate a wide range of needs.

Apple Mac OSX accessibility features include:

- High resolution and Night Shift modes. Designed to aid user comfort. Night Shift is particularly important on Apple devices as the screens are of high quality and as such can be very bright.
- Switch on an on-screen keyboard, enabling the use of a Mac product from a mouse or touch screen only where required. This is a very common interface for iPhone and iPad users, where the on-screen keyboard is a default way of entering text information.
- Magnification, where part of the screen is magnified to fill the full screen using the Zoom feature.
- Text-to-speech, where the computer will read information back to the user, using the VoiceOver feature. This is very helpful for people that benefit from hearing information as a form of learning, and essential for people who may be unable to read effectively, for instance, due to a visual impairment.

- By connecting compatible hearing aids to an OSX or iOS device, users can activate the Live Listen features, which provide fine tuning for their aids to compensate for specific environments.
- Voice recognition, where speech is converted into text. On iOS devices, users are often already familiar with the Siri feature. On Macs we saw the introduction of Dictate in 2018. Dictate is expected to see significant advancements towards the end of 2019 when the next version of OSX is launched.

Useful links:

- Apple Accessibility – a link to the Apple Accessibility portal (UK).
- Microsoft website – Make your PC easier to use – a link to the main accessibility page for Microsoft Windows.
- Chrome accessibility extensions – a helpful resource page for locating accessibly extensions for Chrome.
- Android Accessibility Overview – a helpful introduction to making Android devices more accessible.
- iPad Accessibility – a link to the Apple iPad Accessibility portal (UK).
- iPhone Accessibility – a link to the Apple iPhone Accessibility portal (UK).
- AbilityNet's My Computer My Way – a helpful introduction to making devices more accessible. This also includes guides for Android and iOS devices.

Physical Disabilities

Introduction

Ergonomic equipment can lessen pain and discomfort or enable access for those with physical impairments. The Individual's ability to choose is the key with ergonomic equipment—different solutions will work for different people in a way which is not always predictable. Having options for users ready for them to try out is an important part of accessibility for those with a physical difficulty or disability.

An example is repetitive strain injury, where the repeated use of standard technology causes a physical injury. Often, we need to change what has/is causing that injury in order to help relieve symptoms and potentially start making progress towards recovery. Another example chronic fatigue syndrome (CFS). This is a condition which severely affects an individual's stamina and overall physical strength. Often, people experiencing CFS cannot work at a standard desktop computer for long periods using a conventions keyboard and mouse, and so need alternative ways of interacting with the computer. Technologies such as voice recognition software can directly address this issue.

Seating

RH Logic 400 and the Ergohuman Mesh

Ensuring that a user is sitting upright, with their back is fully supported, is very important to comfortable working at a workstation. Standard office chairs are expected to follow the Display Screen Equipment (DSE) regulations 1992. The guidance document, published by the Health and Safety Executive, called "Seating at Work", describes the required support and range of movement a chair should legally have. You can view 'Seating at Work HSG57, by selecting this link.

For more information about the HSE guidelines for working with display screen equipment, please select this link to open an introductory leaflet.

Basic Need: Public access areas should expect to provide seating (at workstations), that comply with the law. However, this type of seating has a limited range of movement and is now very much universally available. A standard office chair will not be appropriate for everyone, and additional seating options will be required for some disabled users.

Gold Standard: The pictures above show two quite different, ergonomic chairs. They both offer a much wider range of movement and support. They are also made from more robust materials.

The RH Logic 400 is an example of the most common type of ergonomic chair and is used extensively by the Disability Advisory Service. The University of Oxford have a relationship with Osmond Group, as a main supplier of ergonomic furniture. An alternative supplier is Posturite. With a neck rest and arms included, this chair will cost upwards of £850.

Considerations:

- Ensure that instructions regarding the operation of the chair are to hand. Preferably, have instructions in an open envelope, taped to the back of the chair itself, and clearly labelled. Ensure all staff know how to operate your chairs correctly.
- Ensure effective security to ensure expensive chairs are not simply removed from public access areas.
- Assess what the warranty options are with new chairs should they fail.
- Put in place a system so that ergonomic chairs can be booked for a user with a specific need when they require it.
- Ergonomic chairs can often be larger than the more basic seating. Is there space to accommodate these larger chairs?
- Consider how many users would benefit from a fully ergonomic chair (this might not be limited to people with a declared disability, but those with a temporary health problem, or people who experience discomfort when using workstations)? Should a percentage of chairs be fully ergonomic, and as such, the cost of these chairs be included in the initial instillation/refurbishment of a public space?

Height adjustable desks (including sit-stand desks)

Motorised Height Adjustable Desk and a Mechanical Desk Raiser

Being able to adjust both your chair and your desk, allows for maximum flexibility. This has prompted the development of sit-stand desks and accessories. In the pictures above we can see the different options available. On the left we have a motorised desk which can move between a seated and a standing position at the touch of a button. The entire desktop is moved. The second picture shows a mechanical desk riser. These sit on a standard table top and typically have physical controls to change position between near flat (as you have the depth of the device itself, it will never be totally flat to the surface of the desk it is sitting on), and the standing position. Clearly, these offer less flexibility, but are typically much cheaper and do not require the removal of an existing desk. This can be important when furniture is a “fixture”, or in the case of some college libraries, listed furniture.

Basic Need: A simple mechanical riser (also known as Sit-Stand Adaptors), which is left clear so that a user can operate their own laptop (or a locally loaned laptop where available), would be an acceptable first step to accommodate sit-stand use. There are a number of alternative products in this space. The picture shows the “Oplift Sit-Stand Platform”, which is approximately £250. Select this link to view a number of mechanical desk riser alternatives through Osmond Group.

Gold Standard: Providing a range of alterative workstations, which includes a number of electrically operated sit-stand desks, offers high levels of flexibility for users. These desks have the benefit of being able to come down to a low height for smaller seated users, up to a moderate level to support taller seated users, and then all the way up to support taller standing users. Again, there are many alternatives on the market. Prices start from £500. Select this link to view a number of sit-stand desk alternatives, through Osmond Group.

Considerations:

- If a sit-stand desk is holding a workstation, care is required to ensure that when the desktop height is moved, all cables have an adequate travel length, and that items on the desk itself are reasonably secure.

- Sit-stand desks are not typically any larger than standard desks. However, it is likely that the range of finishes for these desks may not exactly match your existing furniture.
- It is important to ensure that ergonomic seating is also available with these desks, and that they are easily accessible for users. Avoid placing these desks in corners, or where access may be difficult for a user with walking aids.

Foot Rests (including height adjustable)

Relax Foot Rest and Footform 2 Height Adjustable Foot Rest

Many people find that when they are sitting at an appropriate height for their table top (2-3 finger widths between the top of the thigh and the underside of the desk top is typically suitable), their feet are not flat on the floor. Reducing the height of the chair to accommodate this will result in lifting the shoulders to accommodate the lower working position. To support an appropriate working position, users may require a footrest.

Basic Need: A simple footrest, with a limited level of height adjustment (shown above is the Relax foot rest), is often sufficient for public areas, as no manipulation is typically required for the majority of people. Basic footrests can start from as little as £25. The Relax footrest is approximately £60. Select this link to view a number of alternative footrests through Osmond Group.

Gold Standard: Height adjustable footrests offer the very best level of flexibility for users. The one shown above is the Footform 2, which offers a very wide range of height adjustment. However, the most popular height adjustable footrest is the Footmate (approximately £40). It has three height settings and a large rounded platform to accommodate a range of foot sizes. Select this link to view a number of alternative footrests through Osmond Group.

Considerations:

- Ensure footrests accompany height adjustable workstations and workstations with fully ergonomic chairs.

Desk Furniture

Standard A4 Book Chair and A3 Document Holder

Holding books and documents open and upright can be difficult for some students. Conditions such as arthritis, repetitive strain injury and chronic fatigue can impact on an individual's dexterity and stamina and this impacts on their ability to handle books over the extended periods required for study.

Basic Need: At least two standard A4 book chairs and documents holders should be available in a library setting (and more for larger settings). Select this link for a range of document holders. Prices start from £17 for a simple document holder. Book chairs are available from £40.

Wrist Rests

Gliding Palm Support and Standard Gel Wrist Rest

It may not be appropriate to make wrist rests available as standard at all workstations, as they can do more harm than good if used incorrectly, or if applied to the wrong situation. As such, care needs to be taken in this area. However, it is also true that where an individual is experiencing discomfort due to their wrists dropping whilst typing, then a standard gel filled wrist rest, in front of the keyboard, will help to prevent the wrist twisting upwards when typing.

There are many devices that offer similar support for the wrist when using mice. The Gliding Palm Support as shown above, attaches to the mouse itself. This ensures that the support travels along with the mouse during operation, and is not left static in one location on the desktop.

Basic Need: Having a couple of simple wrist supports available for use on request would be ideal. Gel is preferred over foam. Select this link for a range of options, which start at £7.

Ergonomic Keyboards

Microsoft Ergonomic Keyboard 4000 and Goldtouch Go 2 Mobile Keyboard

The purpose of ergonomic keyboards is to change the physical shape and feel of the device, to help meet the specific needs of the user. There are many different designs available. Some devices are large, with a fixed split between two halves of the keyboard. This design helps to reduce the amount of twisting required in the wrists. The keyboard on the left is the Microsoft Natural Ergonomic keyboard. You can see that it has a large padded wrist rest to the front, which can be used to help support the wrists. The keyboard rises in the middle to reflect the length of the fingers. However, this keyboard is larger than any standard keyboard, which forces the pointing device (most commonly a mouse), far out to the side for a right-handed user. This may not be a good idea if a user is using the mouse regularly, as it causes quite a lot of stretching. This keyboard is more appropriate for a user who employs shortcut keys to navigate rather than a mouse.

An alternative to ergonomic keyboards with a fixed split, are keyboards like the GoldTouch Ergo (above right). Here we see a design that allows the user to customise both the width of the split in the middle, and the height. Also, notice how this keyboard is relatively compact and has no integrated wrist rest, making it much easier to handle and keeping your pointing device closer in to the body.

Please note that all keyboards that offer a split and raise feature are aimed at people who touch type.

Basic Need: A variable split keyboard could be connected to a standard workstation as its default keyboard, or as a secondary keyboard if preferred (it is possible to have two keyboards connected as the same time, with no ill effects on the usage of the computer). Select this link to view a number of ergonomic keyboards through Osmond Group. Keyboards start at £40 and go upwards to £300 for specialist models.

Gold Standard: Having a range of keyboards would simply allow users to make a comparative choice.

Considerations:

- Wherever possible, have alternative keyboards connected and working. This encourages users to try them.

Compact Keyboards

Standivarius Piano Compact Keyboard

Compact keyboards are incredibly versatile devices, and are especially helpful for those people who need to restrict gross physical movements. This can include people with RSI or fatigue issues. They are also a popular alternative to a standard keyboard because they allow the pointing device to be kept much closer to the body. The size of the keys is the same as a standard keyboard, and so the user experience is similar to a standard keyboard.

Basic Need: Having a compact keyboard is more important than any other alternative as it helps in so many different scenarios. Select this link to view a number of ergonomic keyboards through Osmond Group. Keyboards start at £25 and go upwards to £60 for specialist models, including wireless.

Gold Standard: Having a range of keyboards enables users to make a comparative choice.

Considerations:

- Again, wherever possible, have alternative keyboards connected and working.
- Compact keyboards can be incredibly helpful for users in wheelchairs who also utilise a wheelchair tray.
- Consider having a compact wireless keyboard for use by wheelchair users and for maximum flexibility.

Ergonomic Mice

Penguin Vertical Mouse and Evoluent Vertical Mouse 4

There is a very wide range of ergonomic mice on the market. The standard designs provide a more natural fit to the hand and reduce the need to grip the sides of the mouse firmly between thumb and little finger.

The examples above are types of 'vertical mice'. These devices eliminates the need to twist the wrist and encourages control of the mouse using the whole arm, rather than focusing movement purely in the wrist.

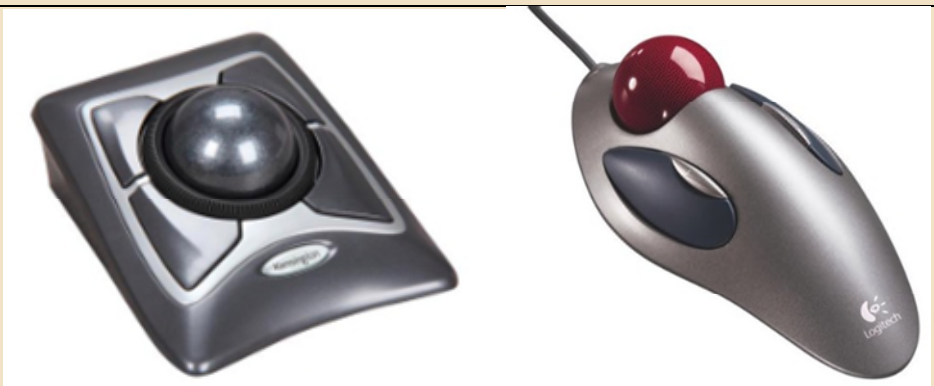
Basic Need: Having one vertical mouse and one basic ergonomic mouse (such as the Contour Unimouse), would be an excellent start in public access areas. Select this link to view a number of ergonomic mice through Osmond Group. Mice start at £40 and go upwards to £120 for specialist models, including wireless.

Gold Standard: Having a range of mice would allow users to make a comparative choice.

Considerations:

- Wherever possible, have alternative mice connected and working. This encourages users to try them.
- Basic ergonomic mice feel so similar to standard devices, that it is often easy for users to simply pick them up and start using them. This is less evident with vertical mice, where some basic instruction may be required to get a user started.
- It is possible to have two mice connected as the same time, with no negative effects on use.

Trackballs



Kensington Expert Mouse (Trackball) and Logitech Trackman Marble

Trackballs are static devices. The user moves the ball, rather than the entire device. This reduces the physical demand on the user and allows each element, control and then button selection, to be done independently. On more advanced devices, such as the Kensington Expert (pictured to the left), there are programmable buttons which can provide features such as a 'drag-lock'. This prevents the user from ever having to both hold a button down and move the ball at the same time. These devices are easy to use when seated on a sofa or easy chair, or when working from the lap.

Basic Need: Devices such as the Kensington Expert are advisable, as they offer the widest accessibility for a range of different needs. Select this link to view a number of ergonomic mice through Osmond Group. Trackballs start at £40 and go upwards to £120 for specialist models.

Gold Standard: Having a range of trackballs would allow users to make a comparative choice.

Considerations:

- Wherever possible, have a trackball connected and working. This encourages users to try it.
- Trackballs are very easy to use and feel quite natural to users without prior advice. However, they tend to be less accurate and slower to use. Many users do not like this if they have become expert in the use of a mouse. However, some users prefer trackballs because they are easier to control due to the slower functionality.

Adaptive Devices

Tracksys Joystick and Keyboard with Keyguard

Adaptive devices can provide high levels of accessibility to specific users. Because they are so specific, they are often only required in individual cases, and are not commonly found in public access areas as standard.

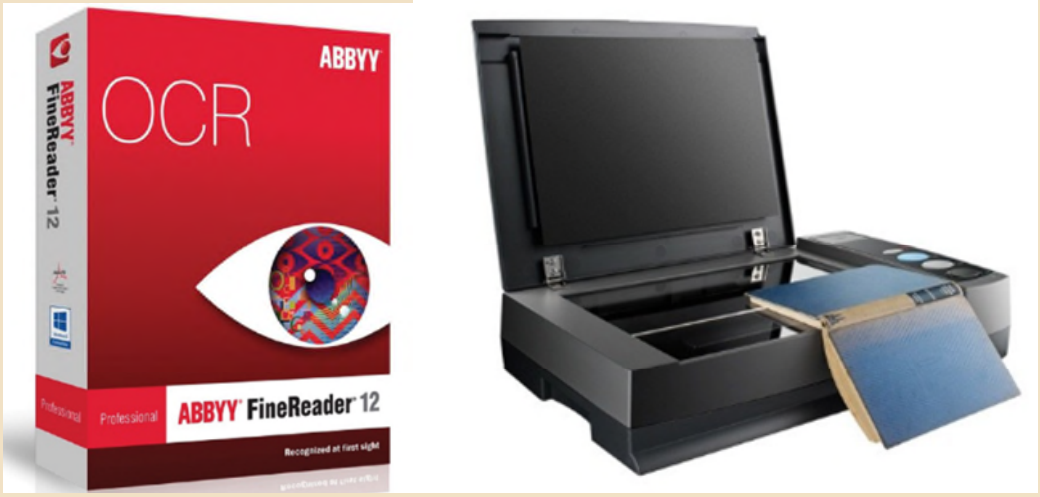
The pictures above show physical devices. However, a significant amount of adaptive equipment will combine hardware and software in order to function. This will require technical support. Examples of this would include eye-tracking systems, such as the Tobi system (select this link for an article on eye-tracking systems empowering people with disabilities), and switch input systems, as used by Professor Stephen Hawking.

Basic Need: I would not consider any adaptive devices to be necessary as a basic need.

Gold Standard: Having access to a loan pool of technology, shared between a number of centres could be helpful. This means that a student who used an adaptive piece of equipment in their personal study space could have this available in the

library environment. Students can obtain funding for personal equipment via Disabled Students' Allowance, or, for international students, DAS guarantees to fund support and equipment that is equivalent to being in receipt of DSA.

Optical Character Recognition



Abbyy Fine Reader and an Opticbook Book Scanner

Optical character recognition (OCR) software is used in combination with scanned text. It converts a picture of text, into readable text which can be edited in a word processor. This has many significant uses. Once processed by OCR, text can be searched, copied and pasted, and used with other assistive software, such as text-to-speech. For someone with physical limitations it enables them to scan physical texts into digital files, reducing the amount of weight they need to carry around with them and reducing the need to handle physical books.

The most common package provided by the University's Disability Advisory Service, is Abbyy Fine Reader Professional. This package supports a range of foreign languages, including Latin and Greek. It can convert and exchange information between a variety of file formats, including the most popular document types of Microsoft Word, PDF, and Rich Text Format.

Within libraries, the majority of the copier/printer/scanners, have the functionality to scan documents to a PDF format, and then email the files to the user. For individual use, all in one printers and scanners can offer flexibility, but do struggle with books as holding the book down on the glass to reduce spine shadow can be a problem. The right-hand picture shows an Opticbook Book Scanner, where the glass goes to the edge of the device, enabling the user to keep the page as flat as possible, ensuring the quality of the scan is maximised. This is important for high accuracy OCR. However, this process is quite slow, as the user will need to scan each page individually.

Basic Need: For the majority of cases, a standard copier/printer/scanner, which incorporates a, "scan to digital file" option, will be sufficient. There are free online services which offer limited OCR. A popular site is OnlineOCR. An alternative with a very basic interface is NewOCR.

Gold Standard: Abbyy Fine Reader Professional is used widely throughout the University. It is an ideal choice for installation on public access computers. The professional version can be used with a range of languages and has extensive file type support.

Other Software to Consider

RSIGuard, Dragon Professional, Global AutoCorrect and Penfriend XL

There is a wide range of software packages which aim to add productivity for users with a physical disability. A few examples include:

RSIGuard: A collection of helpful tools to help encourage users to take breaks when they are working. This package also includes automated mouse clicking and keystroke saving utilities.

Dragon Professional: Voice recognition software can help reduce the sum total of physical load on the body when operating a computer.

Global AutoCorrect: Automatically corrects spelling mistakes as you type, reducing the need for continual re-editing. It provides a range of specialist dictionaries to help students with discipline-specific vocabulary. This package also allows for abbreviation expansion to help reduce keystrokes.

Penfriend XL: Incorporates word prediction (cuts down keypresses), with an on-screen keyboard (use a mouse to control the keyboard), and many other time saving features.

Voice recognition software: Voice recognition offers people with physical limitations to dictate their thoughts instead of typing. This approach is considered in full within the specific learning difficulty section, below.

Basic Need: All of the software above could be considered for use at shared workspaces, considering the requirements of the environment and the needs those using the space. None of the packages should be considered as “required”, but they may be useful to meet particular needs.

Hearing Impairments

It is important to acknowledge that the vast majority of people with a hearing impairment have a minor or moderate impairment. What this means is they can communicate one-to-one, in an environment free of excessive background noise, and where the person they are speaking to has an understanding of how best to communicate with them.

If an individual has a moderate or severe hearing loss, they may be using hearing aids. Hearing aids will typically amplify (some also filter), sound directly into the ear. Many people can hear adequately with their hearing aids, but the effect of having everything around them amplified to the same level can be disorienting.

Some Helpful Communication Tips:

- Ensure you have an individual's attention when you start speaking.
- Always ask an individual if there is anything you can do to help facilitate your conversation. They can then guide you as to the best way to proceed.
- Where possible, find a place to talk that is free of distractions and has good lighting.
- Always face towards the individual so they can see your face clearly and your lip movements.
- Speak normally, but also clearly. Do not speak too slowly or loudly (which can appear aggressive).
- Confirm that the individual is understanding what you're saying.
- Try to remain static. Avoid turning around and don't cover your mouth with your hands.
- When communicating with someone who's using a sign language interpreter, always remember to talk directly to the person you are communicating with, not the communication professional.
- Consider learning to fingerspell and/or some basic British Sign Language (BSL).

Basic Need: All staff in public access centres should be aware of the communication tips above, and have completed some basic deaf awareness and/or disability awareness training (which includes guidance regarding people with hearing impairments).

Gold Standard: It would be advantageous if staff also had an opportunity to learn finger spelling and/or some basic sign language.

Considerations:

- Is there an ongoing relationship with a local deaf awareness company, charity or service?

Amplification Equipment - Including Induction Loops

Contacta IL-PL20, Listenor Pro, Conversor Pro and Roger Pen System

Over recent years, the use of digital hearing aids has increased rapidly. This has been due to the introduction of testing, prescription and purchase of aids being drawn into high street shops. Higher levels of retail involvement has had a significant impact on the traditional infrastructure of support in the UK. Whereas in the past, hearing aid users would have been working with an audiologist and had training for how their aids work with UK infrastructure, we now see far more people who simply put in their aids and switch them on. They have no knowledge, or need of this infrastructure, they simply have everything amplified, all of the time, to a level they find comfortable. As such, it is now common for many hearing aid users to simply ignore expensive loop amplification installations altogether.

Many people who have worked in public access centres will be familiar with this symbol. It refers to the use of Telecoil. A Telecoil is a small coil often found inside hearing aids. The coil works as a small receiver which picks up signals from a loop system that acts as an electromagnetic field. Hearing aids with an activated Telecoil can convert this electromagnetic field into a sound signal.

Loop systems can be as simple as a portable solution, such as the Contacta IL-PL20 (approximate cost £135). You no longer need a specialist supplier for this type of equipment, although a specialist would be able to provide guidance and support. A portable loop system is simply placed on the counter near the service provider. It contains a microphone and an amplifier tuned to the correct frequency. So long as the hearing aid user has an active Telecoil setting, they will automatically receive the amplified signal.

More complex loop systems are installed into theatres and cinemas etc. However, they are essentially the same technology.

Where additional support is required, there are a number of options. In the pictures above, the second picture shows a product called “Listenor Pro”. This is a very simple amplifying device which incorporates a microphone. The user simply wears either headphones or earphones, and then directs the Listenor Pro at whoever is speaking. The microphone is directed, which means that it will limit background noise (although this is never perfect). The user can turn up the volume to the required level. This approach is helpful for those people who have a minor hearing impairment where hearing aids are not required, or if the individual struggles significantly with sound distractions. There is no need for the user to ask the speaker to wear a microphone, improving independence. The Listenor Pro can also be used

around the home (amplify TV's etc.), and is very affordable compared to higher-end products.

The middle right picture shows the "Conversor Pro". This is an affordable personal loop amplification device. The speaker wears the larger device, which incorporates the microphone and transmitter. The user wears the receiver around their neck. The user has the option of either wearing headphones, earphones, or use the Telecoil setting on hearing aids, if they have this available. This product is very popular in education as it is robust and affordable. Its compatibility with external headphones makes it suitable for a wide range of uses.

The picture on the right is of the "Roger Pen System". This is a highly flexible product which is typically linked to an individual's hearing aids via bluetooth (using what we call shoe adaptors, which are specific to each model of hearing aid). It has a powerful set of features. It can be worn around the speaker's neck, like the Conversor Pro, laid flat on a table to act as a conference mic, or pointed at an audio source like the Listenor Pro. There is a wide range of accessories which go with this product, including desk microphones, lapel microphones, a base station for charging and connection to audio equipment and computers, and specialist receivers which provide direct headphone support should the user not wish to use their hearing aid., The Roger Pen System remains incredibly popular due to its features and impressive design.

	The most recent update to the Roger system is the Roger Select. It is a highly portable system with a very wide range of features. Its use of directional microphones makes it ideal for use in a wide range of educational settings.

Basic Need: Many public access centres will install a portable loop system at their main service desk. They will typically leave the device prominent, or simply display a sign to denote that it is active. It is best practice to ensure that an enquiries desk is away from ambient noise.

Gold Standard: Having additional portable loop systems, so that they could be taken to meeting rooms as and when required and/or a Conversor Pro system with headphones, would offer a very flexible accessibility solution to a wide range of users. However, it would need to be noted that it is highly likely that this technology would be used infrequently, so it may be better for these resources to be shared between centres. Students who need these devices will often have been provided with their own device via a Study Needs Assessment, funded by Disabled Students' Allowances).

Vision Impairments

There are many ways to improve the access to computer equipment through the use of assistive technology. As with hearing impairment, the extent of vision loss is variable, so a variety of solutions are required.

Create Accessible Documents and Signs
Accessibility is always best when it is built-in, rather than retro-fitted. There are a number of standards which have been created to help all users ensure that the documents and signs that they are producing are accessible to people with visual impairments. The first step to inclusivity is ensuring that your centre follows these guidelines wherever possible.

Some helpful guidelines and organisations:

- How do I create accessible documents? by the RNIB.
- Accessible Digital Office Document (ADOD) Project.
- UK Association for Accessible Formats - UKAAF's objectives are to promote the better integration into society of blind and partially sighted people, or others with any disability or condition which makes reading difficult.
- Creating clear print and large print documents – a PDF guide by UKAAF

Daylight Lamps and Lighting

Daylight Desk Lamp and Variable Lighting Desk Lamp

One of the most effective ways of ensuring a partially sighted reader's comfort is to control the lighting. There are different approaches, to suit individual preference. The most common request is for daylight lighting. Daylight lamps are non-flickering and typically include an opacified diffusion cover, so that it will emit flicker-free and non-glare light. The purpose of this is to make the lighting softer on your eyes and avoid eye fatigue.

Not all readers prefer daylight lamps, but rather they prefer warmer, more yellow lighting. Again, there are lamps that can cater for this requirement.

Basic Need: There is a very wide range of suitable lamps on the market. Your preferred suppliers will likely have options available. However, an example of a generic lamp with a range of settings is the LE 8W Daylight Desk Lamp. This costs under £30, and would be considered a basic need in a library environment.

Gold Standard: In addition to having daylight lamps, it would also be beneficial to have adaptable lamps which offer a wide range of settings. An example of this is the Topelek LED Desk Lamp. It has nine different lighting modes, to accommodate the most specific of needs. Lamps like this are usually under £25.

Considerations:

- It may be helpful to review the type of standard lighting you have in your centre. If you use strip lighting, is it diffused already? Do you have natural lighting through windows available in certain places, that you could take more advantage of?
- Be aware of industry standards for light levels in libraries and check that these are being met.

Large screens

29” Widescreen Monitor

Simply connecting a larger screen to a computer will increase the size of the information (so long as you do not change the resolution). As such, large screens are the most basic and effective way of improving the visibility of information for users with less severe visual impairments.

As computer gaming has become ever more popular, we are starting to see monitors as large as 36” being used on the desktop. It is also very popular to incorporate two separate screens side by side, and extend your desktop across both.

Basic Need: Consider having between 5%-10% of your public access systems with larger screens. These would not have to be all 29” screens and above, but perhaps a mixture of 20”, 24” and an occasional 27”-29”.

Gold Standard: When purchasing or updating public access systems, consider the quality and size of the standard screens that you specify.

Considerations:

- Where you have a large screen consider whether it can be easily connected to a laptop. This would help users with their own systems to have the benefit of using a larger screen when in a public access space.

Enlargement, Magnification and Basic Reading (Text-to-Speech)

Windows Magnifier and ZoomText Reader and Magnifier

Earlier we noted that all of the major operating systems, including Windows and Mac OSX have built-in accessibility features to help users with visual impairments. However, for a more comprehensive set of features, additional software may be required (especially on the PC where the free Windows Magnifier is very limited). Packages such as ZoomText, Dolphin SuperNova, Magic and iZoom all provide a rich interface full of helpful tools. These include a wide range of magnification levels (many go up to x32), pointer enhancement, colour and contrast adjustments, and document reading utilities to help reduce the amount of information on a screen to aid focus.

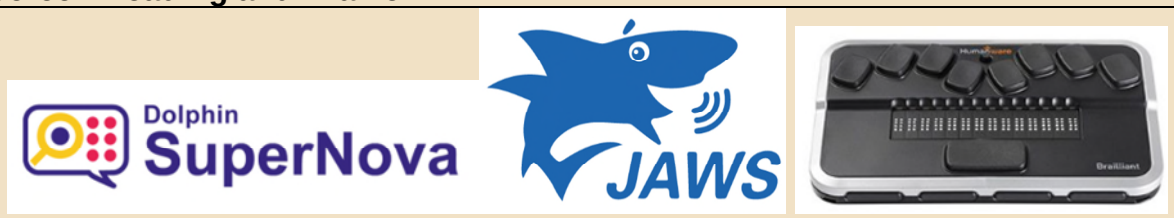
Basic Need: In a public access centre which is dominated by Windows PCs, it would be advisable to have at least one system installed with a magnifier and reader package, such as ZoomText Reader and Magnifier. ZoomText in particular is very straightforward to use and so is ideal for new or infrequent PC users, and for support staff with limited prior experience. A single licence for ZoomText is approximately £700.

Gold Standard: Magnification and reading software can often be installed via a site licence, or with license leasing over a network, so that just a few licenses can be used on any PC when required. Clearly, multiple licenses and site licenses are a significant investment.

Considerations:

- Where there are a number of public access centres working across a network, it would be sensible to standardise on a single software package. This would help with training and support.

Screen Reading and Braille



Dolphin SuperNova, Jaws Screen Reader and a Braille display

For users with no vision, or who simply require more extensive support from speech output, then screen reading software is needed. Packages such as Dolphin SuperNova and ZoomText Fusion, offer the combination of screen magnification and full-screen reading in one package. However, where magnification is not helpful, a screen reader alone is often preferred. The leading package for this Jaws, by Freedom Scientific. Screen readers are most commonly used with speech output in the UK, rather than combining them with a Braille display. This is not the case in many countries, including some European countries. However, where Braille is used, each of the packages mentioned will support this option.

Basic Need: Screen reader users do not expect this software to be offered as standard in a public access centre. This should be considered highly specialist and where support for use is required, users should be referred to a suitable repository of support (such as a Disability Adviser in the case of students).

Electronic Magnifiers (CCTV) and Handheld Devices

ClearView C 24, a Range of Magnifying Lenses by Optelec
and a Ruby Digital Magnifier

Electronic magnifiers (often referred to as Closed Circuit Televisions or CCTV), have been an important accessibility aid in public access centres for decades. The technology may seem to have remained static over time; essentially a camera produces an enlarged picture of a document on a screen. However, modern systems now incorporate a number of new features. These include colour changing and colour substitution, line tracking, and OCR with speech output, to read information directly to the user.

Handheld magnification provides support on the move. This is particularly important for many individuals as they work in a library setting. Magnification lenses have been used for centuries and are still an effective aid today. They only require batteries if they incorporate a light, and are very simple to use. A number of different options can be found on the RNIB website.

Digital magnifiers allow for a greater range of features. The Ruby, pictured above, has variable zoom and colour changing features. It can also store what you are viewing as an image so that you can review it later, or simply transfer it to another system. These devices typically incorporate their own lighting and often use guides to hold them steady at a set distance from the page.

Basic Need: A simple, high quality electronic magnification system will start at around £1,500. The ClearView by Optelec incorporates a 24" HD screen and is closer to £2,500. A range of simple handheld magnifying glasses, preferably including lights, is an excellent basic step for any public access centre.

Gold Standard: For a little over £4,000 the ClearView C 24 HD Speech, incorporates text to speech into the electronic magnifier. There are cheaper ways of achieving similar outcomes. It is high quality hardware, easy to use controls and has accurate OCR and reading software.

Considerations:

- Where there are a number of public access centres working together, it would be sensible to standardise on a particular range of products. This would help with training and support. This might enable a higher specification unit to be available where it was most needed across the centres.

Book Scanning and Reading

ReadDesk PC and Bookeye 4

For a blind or partially sighted user, text will often need to be converted into a digital format (Braille is an alternative for some users). Portable solutions such as the Read Desk can plug into a standard computer. Documents placed under the camera are photographed and then passed through an OCR software engine (we discussed OCR in the physical section above). Devices such as the ReadDesk PC offer portability, power, and independence, but often at the cost of speed and quality when compared to a more comprehensive system such as the Bookeye 4. The Bookeye 4 is a dedicated device with simple to use interface, and is often left available for people to use themselves. You can place your book or document onto the scanner

and then quickly scan multiple pages which are then stored on a USB thumb drive. OCR is completed automatically on each page and the text embedded into the digital files.

The main consideration when scanning and reformatting text for partially sighted users, is how much the individual can do for themselves. If they can identify resources and ensure that they are accurately positioned on a scanner, or under a camera, then a high level of independence can be achieved with this technology. However, if the individual is not able to identify resources and would not be able to tell when a document is in the correct place for scanning, a level of human support is still required.

Basic Need: The standard copier/printer/scanner used in public access areas will typically be adequate for the majority of needs. If there is some staff availability to provide assistance, support can be provided to almost all users. However, when using copier/printer/scanners, it is important to recognise that OCR will need to completed afterwards, using software such as Abbyy Fine Reader (which is reviewed in the Physical section above).

Gold Standard: For a little over £700, the ReadDesk PC offers portability and flexibility. It can be connected to a laptop or desktop PC with a standard USB connector. There is software which will need to be installed. The Bookeye 4 is an expensive, but highly effective, scanner. They are typically upwards of £4,000 (prices are typically upon request).

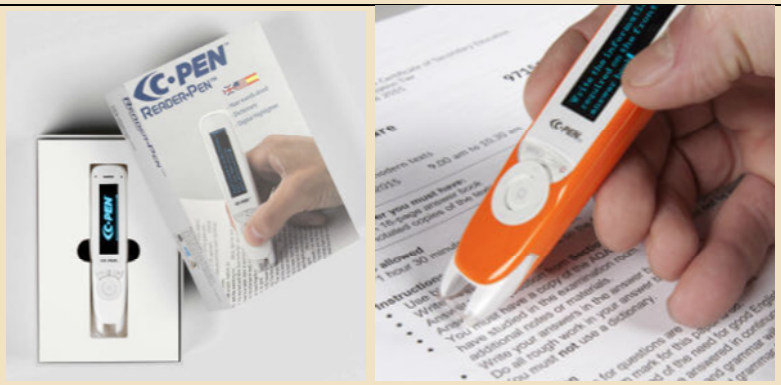
Considerations:

- Understanding the needs of your users and estimating the amount of scanning that may be required, will help you to understand what equipment may be right for your centre.

Specific Learning Difficulties

As of the end of October 2018, 5% of the student population at Oxford had received a formal diagnosis of SpLD. In the wider population it is approximately 10%.

Scanning Pens



C-Pen Standard and Exam C-Pen

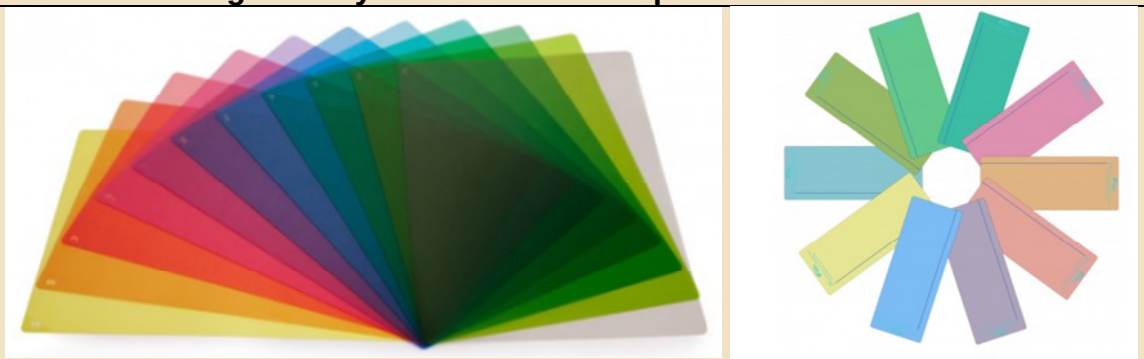
Scanning pens provide users with the ability to scan, look up and read back information as they are researching. The most popular scanning pen, the C-Pen, which can be recommended for qualifying students as part of a Disabled Students' Allowance, uses the Collins English Dictionary, and supports English, Spanish and French. The C-Pen also has a scanning function, so that users can scan and store lines of text which can be transferred back to their computer later. It also has a voice recording feature, but this has limited functionality compared with dedicated digital voice recorders.

In the pictures above you will see both the standard C-Pen and the Exam C-Pen. The Exam C-Pen has been developed with restrictions, so that it can be used in exam situations. It is certified to be used in state examinations without individual approval.

Basic Need: Having the examination version of the C-Pen available for students upon request, has been adopted by many institutions. This could be considered a practical and easily adopted 'reasonable adjustment'.

Gold Standard: Having a standard C-Pen available within each public access centre, which could be requested by users of the service, could be beneficial. However, the pen needs to be charged and regularly wiped for stored data. This would require staff to take responsibility for the equipment and learn how to use it effectively. There would also need to be some basic guidance for users requesting the C-Pen. The C-Pen costs £200 for one, but there is a reduction per item when you purchase them in bundles.

Coloured Reading Overlays and Coloured Paper



Crossbow Coloured Reading Overlays and Reading Rulers

Coloured overlays help address the effect of scotopic light sensitivity and/or visual stress. Perceptual processing disorders include Irlen Syndrome, Meares-Irlen Syndrome and Scotopic Light Sensitivity Syndrome. A high proportion of students with dyslexia and dyspraxia also experience these symptoms.

The overlays are placed over standard black text printed on a white background. The effect is to colourise and reduce contrast. Ideally, an individual would have opportunity to try a number of different colours before choosing their preferred overlay. Overlays typically have a matt side and a glossy side. The matt side is designed to reduce reflection of light, and is by far the more popular way of working.

However, some people prefer the glossy side as this can darken and thicken black lettering.

In addition to standard overlays, reading rulers are popular. These are a large bookmark size, in the same overlay colours, but with a dark line often a couple of centimetres from the top. This helps with tracking. The same effect can be achieved by drawing a thick line on a standard overlay.

One alternative to coloured overlays is to print on coloured paper. Pukka Pad produce a specialist range of lined pads in association with the Irlen Institute. They cover a range of the most popular colours. A low cost alternative is the Cambridge Legal Pad.

Basic Need: A selection of coloured paper should be made available to load into printers and copiers, and a couple of sets of coloured overlays and reading rulers to be held in each public access centre. Paper should be thick enough to prevent the other side showing through and matt paper rather than glossy is preferred as this reduces glare. Colours required for each set would include as a minimum, yellow/cream, pink/rose, aqua, jade/mint green, orange and magenta. Yellow has been recommended as a basic default by RNIB and the British Dyslexia Association. Although coloured overlays can be purchased from retailers such as Amazon, for bulk orders of sets, it is advised that the university deal directly with Crossbow Education. Overlays cost from £3.50 each, and reading rulers cost from £6 each.

Multifunctional Literacy Support Tools

TextHelp Read&Write and ClaroRead

Multifunctional literacy support software incorporates numerous features to aid reading, writing and study skills, in a single application. The most prominent feature has always been text-to-speech. This is where text is read back to the user via synthetic speech. The leading packages in this area are TextHelp Read&Write and ClaroRead. Both of these packages are available on the PC and Mac platforms.

Features often found in multifunctional literacy support software include:

- Phonetic spellchecking
- Homophone support (often includes confusable words and options for creating your own set of words)
- Dictionary definitions (often including picture dictionary support using a symbol set such as PCS by Mayer Johnson)
- Grammar checking (limited)

- Word prediction
- Optical Character Recognition
- Conversion of text sections into an MP3
- Study skills features (highlighting, word webs, organisation tools)
- Voice recognition (typically utilising the inbuilt voice recognition software within the operating system)

Basic Need: Simple text-to-speech is included as part of the standard accessibility features of both Windows and Mac OSX (as described earlier). In addition, there are a number of popular pieces of shareware/freeware which can also be downloaded and installed by students on to their own laptops. Examples include: NaturalReader and Balabolka.

Gold Standard: Having full licenses of either/both ClaroRead Plus and TextHelp Read&Write installed on some/all public access computers. This software is regularly recommended as part of Disabled Students' Allowances so students needing the software will be familiar with it already. There are many different ways to purchase both ClaroRead and TextHelp, including yearly subscription for individual users (£180 per year) through to site licenses. An OEM license through a DSA retailer in the UK is less than £200.

Visual Structure Tools (Mind Mapping)

Inspiration and MindView

Mind mapping applications are used by students with SpLDs as they enable building and structuring of ideas in a visual way. The most popular packages are Inspiration and MindView, used extensively by students at Oxford.

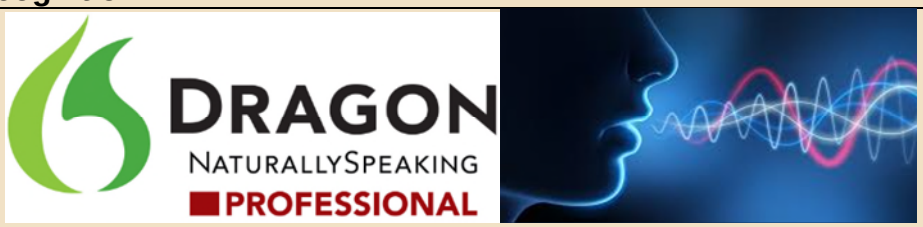
Inspiration is easy to use and is very free-flowing in its design. It works very well for people who think visually. It does not include many features now considered standard: It has limited export options, the note areas are small without adaptation, and maps can get quite cluttered.

MindView has a wide range of features, including help with referencing and time/resource management tools. The interface is neat and professional, and allows for a large area of the screen to be devoted to notes. However, the additional functionality makes the package more complex to learn and use. Basic functions which are just a click away in Inspiration, may require four or five steps in MindView.

Basic Need: There are a number of online mind mapping packages. Many offer free basic services, such as XMind, MindMup and MindMapFree.

Gold Standard: Having full licenses of either/both Inspiration and MindView installed on some/all public access computers would be ideal. This software is regularly recommended as part of Disabled Students' Allowances. Inspiration is typically purchased through a UK re-seller for approximately £60. However, the US version can be purchased for as little as £32 online. MindView is less than £100 through a UK DSA provider, and $379 online for the US version.

Voice Recognition



Dragon Professional / Microsoft Windows Cortana / Mac Dictate

Voice recognition offers the user the ability to control a computer completely through the use of speech commands. When we think about voice recognition for people with a specific learning difficulty, we are essentially trying to answer a single question. That question is, "Do ideas get lost, between your mind and your fingers on the keyboard, that wouldn't get lost if you could simply say them?" If the answer is yes, then voice recognition offers something nothing else can, and that is a link between verbal and written expression.

Voice recognition is a complex piece of software to learn and use. If made available, it is important to ensure that training and support is in place. However, developments over the last decade, including home speech interface systems like Alexa and Google Home, have started to bring voice recognition into daily life. Both Windows and Mac OSX now have free to use speech recognition built in as standard. Mac use an interface called, "Siri" across many of their IT devices (phones, tablets and computers), but their main voice recognition offering is called "Dictate". It is part of its free accessibility features. Microsoft use a similar system called "Cortana". Again, you can choose to switch on voice dictation as part of the accessibility features.

Basic Need: Ensure that the free-to-use speech recognition systems, which are part of the Windows and Mac OSX operating systems are available. As a quality audio input is essential to ensure accurate speech recognition, USB headsets should be made available on request.

Gold Standard: Having Dragon Professional installed on some public access systems would be an excellent resource. This software is regularly recommended as part of Disabled Students' Allowances. Dragon Professional is priced at £350 with a headset. However, OEM providers, such as those that we use for DSA provision can provide single licenses for less than £100 and headsets for less than £50.

Considerations: To use voice recognition in a public access centre, a quiet space is required, preferably with a door. Voice users can easily disturb others in public spaces.

Grammar and Spelling

Grammarly / SpellEX / Medincle

Modern word processing applications, including Microsoft Word and Google Docs have built in grammar and spellchecking features. These are changing quite rapidly as both pieces of software receive regular online updates. For more information about how these features work, follow these links:

- Correct your spelling and grammar in Google Docs.
- Correct spelling and grammar in Office.

The standard features in Word and Google Docs can be supplemented with third party applications. For grammar, the most popular package is Grammarly. There is both a free and paid version of Grammarly, depending on the features you require.

The reasons for installing additional third-party spelling support is the need to check specialist vocabulary, such as legal, bioscience and/or medical words, which are not found in the Word and Google Docs versions, or that the user is making spelling errors which are not close enough to the accurate spelling for standard applications to accurately predict the correction.

For individuals that who need a wider variety of spelling options, including phonetic support, then multifunctional literacy support software (above), is the best option. These packages will typically offer longer lists of word options for misspellings, along with the options to look the words up in a dictionary and have them read back for confirmation.

For specialist dictionaries there are numerous options. SpellEX are the largest worldwide provider in this market, and their products integrate with Office and Dragon voice recognition software. UK based company Medincle, offer a medical and legal product, which again integrates with Office, MIndView and Dragon. This package is very popular in the UK DSA market as it was developed with the UK in mind, where words and terminology can be different to the US market.

Basic Need: Providing details of these products for all students would be beneficial, so that they can choose to purchase them if they wish.

Gold Standard: Having specialist dictionary support on selected systems may be of benefit in specific locations. For instance, a library that specialises in science, would benefit from having the SpellEX Bioscientific package installed, and a medical library would benefit from have Medincle etc. SpellEX starts from around £100 (but it is regularly on offer for less). Medincle is priced at just under £60 for the basic spellchecking package, and then up to £134 for the package which incorporates Dragon and MindView support.

Considerations: Installing custom dictionaries over networked computers has been notoriously difficult. With modern applications regularly receiving automatic updates it is important to check that specialist dictionaries are still working.

Limiting Distractions

Moldex Disposable Pura-Fit Earplugs 34dB, Reusable 37dB Earplugs, a Study Carrel, and Sony WH-1000XM3 Noise Cancelling Headphones.

Many people struggle with distractions in public spaces. This can be very difficult for students who need to use libraries regularly in their studies. Many libraries are non-lending, which means students cannot take books away to private spaces.

Having disposable earplugs available for us can help with the most common distraction, that of noise. For people who find noise distraction a regular issue for them, then making available reusable plugs that fit more snugly and offer better noise suppression may be a better choice. Plugs cost from as little as 20p per pack and can be helpful for all students, not just those with identified needs.

An alternative to earplugs is noise cancelling headphones or earphones. Low cost noise cancelling headphones, such as the Lindy NC-40 (these retail for £50 and are the headphones recommended through Disabled Students Allowance), offer a limited amount of support and as such receive mixed feedback from users. High-end products such as the Sony WH-1000XM3 headphones, are very highly rated by users. However, these noise cancelling headphones typically cost in excess of £275.

People can also be distracted visually. Having small private study rooms or study carrels available, to book on request, can be incredibly helpful. If this is not possible, simply having some study spaces that face blank walls and which also have limited distractions to the sides, can be a significant improvement.

Basic Need: Having disposable earplugs available in public access areas would be helpful and low cost. Ensuring that there are some study spaces which have been designed to help reduce distractions should also have fewer related costs. There may be an argument for having a pair of basic noise cancelling headphones available upon request, but alcohol wipes would also be required so that they could be cleaned after each usage.

Gold Standard: Providing private study spaces, such as personal rooms and/or study carrels, which can be booked (with priority given to students registered with the Disability Advisory Service), would be ideal for students who struggle to focus.

Other considerations:

- Consider ways of eliminating unnecessary noises in the environment. Replace clocks with an audible ticking mechanism with silent models. Where possible, ensure that doors can be closed without noise.
- Some students with SpLDs find it difficult to work in an environment that is distraction-free. Consider whether a discrete area is set aside in the library which allows for a more flexibility approach to study.

Appendix: Software freely available online

Demonstration / Trial Software

- **Microsoft Office Pro Plus 365** is free to download to all students who have an academic e-mail address and should be available to download from most University websites. Some Institutions have agreements in place which give their students access to additional features within Office 365. If you would like to find out more about this then please contact your University, alternatively, please click on the following link to download your free copy of Office Pro 365. https://products.office.com/en-gb/student/office-in-education

- **Inspiration** free trial: http://www.inspiration.com/freetrial#desktop

- **MindView** free trial: https://www.matchware.com/free-trial?filename=mindview_ge

- **TextHelp Read and Write** free trial: http://www.texthelp.com/north-america/our-products/readwrite/downloads/download-trial/

- **ClaroRead** free trial: https://www.clarosoftware.com/demo

- **Sonocent Audio Notetaker** free trial: https://www.sonocent.com/en-us/download

- A useful application which can be used to help limit distractions whilst using a computer is **FocusMe**. More information is available from http://focusme.co/. Please note that this software is not currently supported by your funding authority.

- **KAZ touch typing tutor** includes a specialist version which has been created specifically for people experiencing dyslexia. Please note that the cost of this package cannot be included in your DSA. https://kaz-type.com/product.aspx

System Utilities, Shareware and Freeware

- For simple synthetic speech, you may benefit from the use of **NaturalReader**, a package which has both a paid and free (with limitations) version. Please note that this software does not have the same quality of intonation as a package such as TextHelp Read&Write, without paying for quality voices. However, it is effective as a simple text reader. http://www.naturalreaders.com/ (PC and Mac compatible).

- Another popular text to speech program is **Balabolka**. You can download this software free of charge from CNET - http://download.cnet.com/Balabolka/3000-2170_4-75182534.html (PC only).

- On the PC, there is a powerful text to speech tool for people with visual impairments, called '**Narrator**'. https://support.microsoft.com/en-gb/help/17173/windows-10-hear-text-read-aloud

- On the Mac, there is a free text to speech utility called '**Voice Over**'. This is a powerful feature which is suitable for people with visual impairments. https://www.apple.com/uk/accessibility/mac/vision/

- A simple way to tint a screen on a Windows based PC is to use the free '**Night Light**' setting: https://support.microsoft.com/en-gb/help/4027563/windows-10-set-your-display-for-night-time

- A simple way to tint a screen on a Mac based PC is to use the free '**Night Shift**' setting: https://support.apple.com/en-gb/HT207513

- Computerised flashcards can be an effective way of improving memory, especially during revision. **Anki** is a popular and free piece of software used by many students, which already has a large number of pre-made card packs. http://ankisrs.net/

- **Grammarly** is a free web-based tool which can help with understanding and correcting grammar mistakes. https://www.grammarly.com

- A useful tool for managing a list of tasks is **Wunderlist** (free option available). https://www.wunderlist.com/.

- **Evernote** is a helpful tool which can aid organisation of research materials which can then be synced between a number of devices (including your phone). To sign up for free, go to https://evernote.com/

- A useful tool for managing references is **Mendeley**. This software is available over the internet. For a free account go to https://www.mendeley.com/

- Free typing tutors online. This article includes information about 20 free touch-typing tutors which you may wish to review, download and try. http://merabheja.com/top-free-typing-softwares/

- Windows CCleaner. **CCleaner** removes cookies, temporary files and various other types of unused data that clogs up your operating system. This frees up valuable hard disk space and can allow your system to run faster. Removing cookies can help protect your anonymity and improve overall security online. There is a range of additional tools, including a registry cleaner and software uninstaller.

- Anti-Malware: **Malwarebytes' Anti-Malware** can detect and remove malware that anti-virus applications may have failed to detect. Malware can significantly reduce the speed of your computer. http://filehippo.com/download_malwarebytes_anti_malware/

Mobile and Tablet Apps

- **SAM App**, is a smartphone and tablet application which can help you to understand and manage anxiety. For more information, please go to

http://sam-app.org.uk/

- Apps for iPad, iPhones and Android devices, a guide by the British Dyslexia Association http://bdatech.org/what-technology/small-portable-devices/apps/

Free Online Services and Resources

- For students interested in Cognitive Behavioural Therapy and/or an introduction to Mindfulness, a free seven-day introduction can be completed online with www.calm.com

- A range of supportive resources and podcasts, which might be of interest to all students, is available on the University of Oxford Counselling Service website here: https://www.ox.ac.uk/students/welfare/counselling/self-help?wssl=1