Deafblind Resource Guide

Training people with deafblindess in using Information and Communication Technology

A guide for TAFE, Universities and Community Educators

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australia

multiple disabilities, unlimited opportunities

INTRODUCTION

The Deafblind Resource Guide aims to assist educators in understanding the training requirements of people with deafblindness and to enable deafblind students to access courses in a higher education or community setting. This resource is aimed at helping you to develop the skills and confidence to customise resources and delivery to suit the individual needs of people with deafblindness.

The guide focuses on Information and Communication Technology (ICT) accessibility as computers and the internet have opened the door to training in a wide range of subject areas, not just computer studies. Prospective students use computers to research the range of courses available, current students use computers to familiarise themselves with an educational facility and the range of services available, and in the classroom a computer can be used as a note taker, for communication and to access online materials and undertake research.

Able Australia Services established **Ablelink** internet training in Melbourne in 1998. During the past nine years, adults with deafblindess have become computer literate incorporating the internet into their everyday lives. Their learning has assisted the **Ablelink** staff in identifying the key elements of successful training for people with deafblindness.

This Guide looks at the experiences of the deafblind community as they have tried to access training in their local community using case studies to highlight the experiences of deafblind adults who are currently studying at TAFE or university.

The successful components of training for people with deafblindness are recognising the individual communication needs of each person and their access to a computer and customising resources and training accordingly. Feedback from teachers and students who have had the opportunity to work alongside a deafblind person in their class has been extremely positive. As low vision and hearing loss affect a growing number of people in our ageing society, the ability to address these problems in a classroom will assist many.

The information in this guide includes references to specific software which over time will change and be updated. However the principles highlighted in this resource will remain the same. Similarly web addresses to the specialist software may change or be updated as the technology develops.

Please contact Able Australia Services for further information about customised training or for more information about the dual disability of deafblindness.

Able Australia Services gratefully acknowledges the generous support of the Deafness Foundation (Victoria) in the development and production of this Guide.

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DIVERSITY OF DEAFBLINDNESS

Deafblindness, sometimes called dual sensory impairment, is the combination of both hearing and vision impairment. Most people with deafblindness have some residual hearing and/or sight and a wide range of forms of deafblindness exist.

There are many causes of deafblindness; congenital deafblindness is when someone is born with combined sight and hearing difficulties and acquired deafblindness is when someone loses hearing or sight, later in life.

It is useful to identify two distinct cultural groups within the deafblind community. The first group are born blind and lose their hearing as adults. They tend to continue to use speech as their main communication and have a variety of hearing devices to enable them to communicate.

The second group are born deaf and lose their sight as adults. This group are culturally deaf and use sign language to communicate. A significant community of deafblind people have a genetic condition called Usher Syndrome. They are born deaf and develop Retinitis Pigmentosa (tunnel vision) when they are adults.

A person with deafblindness may strongly identify with the blind culture or the deaf culture (in some cases, neither) as well as the culture of their family of origin. An understanding of the complexity of their culture is important for communication, language and learning.

There are a range of literacy issues which arise from dual sensory disability; however as with the general community, literacy standards within the deafblind community vary enormously and must be a consideration when training.

Where Auslan (Australian Sign Language) is the first language, there may be difficulty reading and writing in English. If people are blind and don't know Braille, all their information is gathered audibly and this can result in poor spelling. Conversely, if they know Braille or have had good hearing or good sight, their literacy may be of a very high standard.

People with deafblindness use a range of communication techniques. An ability to communicate is essential. Communication can be facilitated through the use of an interpreter, note taker or both.

The communication styles vary. Auslan is widely used and often a deafblind person uses a modified Auslan within a confined body area relevant to useful vision, called visual field signing. Where vision is no longer useful, the deafblind person will modify Auslan further and read it back using tactile sign where they place their hand over the hand of the signer to feel the signs.

If Auslan is not the first language the deafblind person may communicate by spelling the alphabet into the palm of a person's hand and this is called deafblind finger spelling.

Some people with deafblindness have sufficient hearing to enable them to speak and they usually have hearing aids. In a learning situation some may prefer to communicate with typing on a computer, even using a Chat program.

Email and Internet access are removing the barriers to information and making it easier for people with deafblindness to access courses in higher education and community settings. Communication is possible with email or even sms text.

The interpreter must be sensitive to the needs of the student and make adaptations to their signing to ensure the student can "read" what they are saying.

PREPARING TO STUDY

Before taking a deafblind student on it is advised that coordinators contact Able Australia Services and ask for the Deafblind Services Team.

The Course Co-ordinator and/or the Disability Liaison Officer (DLO) will be initially involved in counselling the student about their course selection and will be able to assist the student in deciding on the time frame allowed for completing the course and how many subjects can be realistically completed each semester within the required time frame.

Consideration will need to be given to ICT accessibility and ensuring that adaptive technology will be available in the class room if this is a requirement. In classes that don't use computers it may be worth having a computer as a communication device. This can allow for the deafblind student to communicate with other students or with the teacher.

Learning materials may need to be produced in alternative format. Long lead times are required particularly if textbooks need to be produced in audio, Braille or electronic format.

Prior to commencement of study the deafblind student may need orientation and mobility training on public transport travelling to and from the place of study as well as around the campus facilities and to specific classrooms. Orientation and mobility can currently be organised through Vision Australia and there are often waiting lists so a long lead time is recommended. If the student has a guide dog they will need to know where they can take their dog outside for breaks and to access water.

Initial meetings designed to address concerns and issues will ensure potential problems are resolved prior to commencement of study and provide for a smooth transition and hopefully an enjoyable and successful experience for all. It is possible to arrange for professional staff from Able Australia Services to give assistance through this initial process to ensure adequate preparation is made.

INTO THE CLASSROOM

With the preparation all in place it is now the responsibility of the teacher to engage the deafblind student in the learning process. Often this is a daunting task when communication is difficult; there may be an interpreter and/or a note taker and a whole classroom of additional students. The only sure thing is the student will be more nervous than the teacher!

When giving lectures it is common to use a data show or PowerPoint slides. It is important to always read the slide text out loud as soon as it is displayed. It is also possible to save the PowerPoint presentation as a text file and make it available to the student prior to class.

In class work or tutorials, it is a big advantage if the deafblind student is able to do some preparatory reading so they have an idea of the content prior to the class. In group work it is important that students are aware of the need to talk one at a time and make sure the deafblind student is able to keep up with the discussion either via the interpreter or with the use of directional microphones if these are used.

For deafblind students, classroom involvement provides a rare opportunity to mix and talk with hearing students and equally they will be an invaluable participant as long as time is taken to ensure their full participation.

There is considerably more concentrated effort required when both hearing and vision is impaired. This should be a consideration in determining the goals for training. With adaptive technology there is another "layer" of commands to learn in conjunction with new software programs. This means they are learning twice as much as their sighted or hearing peers.

Training should be self-paced due to the combined specialised needs of communication and adaptive

technology. Often a trainee will need a longer time to complete the competencies. Disability Liaison Officers (DLO) can assist with the provision of direct learning support, for example sign interpreters, note takers, tutors, personal readers and classroom participation assistants.

Assessment tasks are often a big problem for students with deafblindness. Additional time may be required for reading the print material and writing with the help of a magnifying aid.

The DLO may be able to negotiate alternative learning tasks and assessment or alternative arrangements for examinations, for example a scribe, a reader or additional time. Online assessment tasks will require more time to allow for the aides and in many cases may not even be accessible. This problem cannot usually be anticipated as they are unseen prior to the testing. It is important that alternatives can be provided.

Multiple Choice questions can be a problem for Deafblind students who have English as a second language. The subtleties of the English language can make it difficult to distinguish between the choices.

In some cases arrangements are made for assessment to be completed at home, where the student can use all their own accessibility aides and give themselves more time to complete the tasks. The important requirement is to be flexible in responding to the individual requirements of the student.

TEACHER INTERVENTION

The deafblind student requires a lot of support from many people and often this is a daunting process to co-ordinate. It is encouraged that the teachers stay engaged with their deafblind student and monitor their progress, giving assistance where possible. There may be issues around access to the learning materials or a specific issue that is overwhelming for the student and sometimes the teacher is able to find the best solution with some practical lateral thinking.

Ongoing communication can sometimes nip potential problems in the bud and a show of concern from the teacher is a great support to the student. The teacher may be able to liaise with technical staff to give assistance around accessibility issues. It is important to remember that each student with deafblindness will be unique and there is no set formula to follow when solving accessibility issues.

CASE STUDIES

Able Australia Services in conjunction with employment services, has provided support for students to study in higher education. The support has included sourcing funds for equipment, interpreters or arranging meetings to discuss how the student can be supported in their study. We have presented case studies of students studying in each of the sectors: University, TAFE and the Community sector. Each case study is unique and the amount of support varies from person to person.

Case Study 1 – Certificate II in a Community College

Jacinta (not her real name) is 48 years old and is deafblind with no vision or hearing. She is studying in a community setting and is supported by Sign on, an employment agency, who assisted her in selecting her course as part of her long term goal to find work. Sign on were also able to secure additional funding for a tutor to assist her with some complex English words. She has two interpreters in each class and at times, a note taker.

Most teachers type up their notes then photocopy them for students as there are no access departments or facilities to assist with the production of electronic resources. In Jacinta's case, it is easier for her to receive electronic copies of the notes on disk or via email, preferably prior to class. Jacinta is committed to brailing all her materials herself, but this is very time consuming and sometimes documents need to be reformatted to prior to translating into Braille. In some cases, teachers were only able to give hard copies and these have to be scanned before they can be printed in Braille.

Jacinta's class is not in a computer room but it is always useful to consider having a computer or communication device so that students can talk to the deafblind person simply by typing a conversation on the screen. The deafblind person can read this with their screen reading equipment giving them direct contact with the teacher and students rather than always via an interpreter. After all, this is one of the main reasons for studying in a mainstream environment.

Jacinta has a small pocket PC with email and internet access but unlike the mainstream variety, hers has no screen and is simply a keyboard with a Braille output display. It also has speech and can be used as a rudimentary communication device (see below).
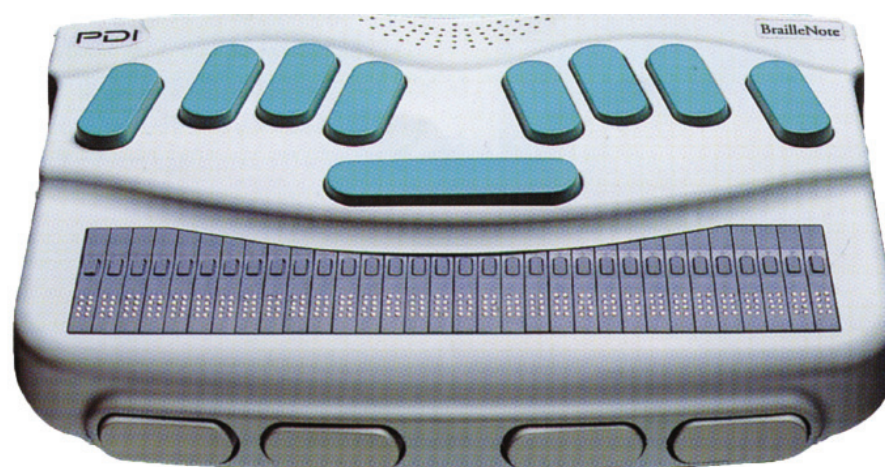
Case Study 2 – Certificate III at TAFE

Angus (not his real name) is 46 years old and is enrolled in Certificate III in Information Technology at TAFE and has chosen to study online. He is supported by SignOn as his long term goal is to find employment in the IT industry. His previous experience of participating in the class room was unsuccessful so he has decided to try the online option.

Angus is deaf and almost completely blind although he has minimal functional vision. He can read the computer screen for short periods but only if the display colours can be changed. When his eyes get tired, he prefers to read with a Braille display attached to the computer.

Angus' course materials are provided in an online format through a platform called CISCO which is an American provider. CISCO has created all the learning resources in Adobe Flash and the information is displayed with a white background and black text. Unfortunately this colour is unsuitable for Angus and as the course work is protected and developed overseas, there is no way of changing the display colours. Angus has somehow managed to copy and paste each screen into his own html format that enables him to change the colours to build accessibility features into the pages. He has created his own search engine and has compiled his own glossary of terms.

Angus has an interpreter available to him for his online study but has experienced frustration in the lack of computer knowledge of the interpreter. His focus is to learn the computer terminology and requires the expertise of a tutor with specialised knowledge. Angus would benefit from more ongoing contact with his teacher or course co-ordinator so that some of these problems can be addressed.

Case Study 3 – Degree at University

Michelle is 50 years old and is studying at University. She is supported by the DLO and has two tactile interpreters for lectures and tutorials and additional support to help with readings and library research. Vision Australia has provided the funds to purchase a Braille display through their scholarship program. When Michelle commenced her study she was able to rely on her vision to read printed materials and used a screen magnification program to read the computer. Unfortunately, her vision has deteriorated and she is now only able to read the computer with a Braille display and she uses tactile sign language to communicate.

The University has many resources on the Internet and some subjects require Michelle to search library databases for additional resources. They also use WebCT as the online learning environment. Michelle has excellent computer skills and loves the challenge of conquering technology but has spent many hours working around accessibility issues. She has been supported by the IT staff at the University in setting up her wireless laptop and is assisted by both Able Australia and Vision Australia in her Braille access to the laptop.

The University has moved to Microsoft Outlook Web mail as their email system and this has limited accessibility for a Braille user. Michelle was able to work with the IT staff at the University to setup her email in Microsoft Outlook on her laptop, as this program has good accessibility with Braille. She has been able to get extra assistance at **Ablelink** in accessing the Library online database.

Michelle had an issue around her assessments as she was asked to complete them on the University computer rather than her own laptop. Unfortunately the University computer used different accessibility software and Michelle would not have been able to "drive" it as all the commands are different. They allowed her to use her laptop as long as she deletes the subject from her hard drive before the exam. It is useful to have regular breaks in exams, or short answer tests, since it takes a huge amount of concentration reading Braille and driving a screen reader on top of the pressure of exams.

She is fortunate to receive limited funding to stay at the University college a couple of nights a week as she was travelling long distances from home to University each day.

Case Study 4 – Degree at University

Angela (not her real name) is 30 years old and is studying in a degree program at University. She is deafblind and uses a screen reader to access her computer; she can hear it with the use of specialised hearing aides called BAHA (Bone Anchored Hearing Aides). She has excellent computer skills and has worked full time for 14 years in an office. Angela has no useful functional vision so relies solely on speech output to read the screen. She can speak clearly but uses a directional microphone to enable her to participate in group work in the classroom. She uses a guide dog for mobility.

Angela is able to complete her course in block mode attending classes Friday and Saturday once a month. She has organised her study herself and is supported by the DLO at the University and her father.

Her University uses Blackboard, an e-learning environment which houses reading resources, email, discussion boards and important announcements. During her first week, when she tried to open these materials she discovered they were all image files. They had been scanned into a PDF format as images rather than using an OCR facility to translate them into text. When she notified the Access Department they fixed this immediately and changed them all into Word text documents. They even setup a special area for her to access these documents that was screen reader friendly. Unfortunately her logon no longer worked in these pages but eventually these problems were ironed out. Having a dedicated Access Department with a quick response time was an enormous help.

Her next obstacle was in accessing Web mail which is usually very difficult and slow with a screen reader, due to the absence of keyboard shortcuts. She received some specialist training in Web mail through **Ablelink** and was able to make sense of it, even though it required a lot of patience to decipher. She wanted to be able to read emails in Web mail as this is the main communication of the University.

Additional to Web mail there is another email facility in Blackboard. The advantage of this email is that it houses the email addresses of other students in the subject thereby giving her an opportunity to make contact. It also houses a discussion facility used by teachers to promote online discussion and it houses a real time Chat facility. Each of these communication tools has accessibility problems with a screen reader. Primarily they have no shortcut keys, so accessing these screens is not straight forward and requires specialist training and time to master. In the case of the Chat facility, this does not work well with a screen reader and keeping up with conversations in Chat facilities is quite difficult.

Blackboard has a useful online tutorial for screen reader accessibility and is committed to working through these accessibility issues. The student needs to decide how much time they have to commit to learning each of these online environments and it is important for them to discuss these issues with each of their teachers. Often simple and flexible solutions can be implemented. For example, one email account and MSN chat might prove a more workable option.

A short time ago, there were no materials available electronically nor were there computers with screen readers to read them. So it is worth focusing on the technology that is efficient and reliable rather than persevere with technology that is not accessible. The problem here is not that she cannot access email but that she can't access three separate email programs. This calls for a more flexible solution. She mainly needs the web mail to receive internal emails from the library or from staff and she is investigating the possibility of setting up an automatic forwarding of this email to her regular email address. There may be another solution for being able to communicate with members of her class via email rather than use the email with Blackboard.

Angela was able to report after a couple of weeks that the Chat Facility in Blackboard was mainly used as a social interaction facility rather than as a learning tool so she felt comfortable enough to ignore it.

She bravely met all the challenges of accessibility and was able to complete her reading and participate in class along with her peers. Her main problem was that the teacher had changed the

assessment tasks, and notified the students verbally in class. She was unsure of this change and was not confident the details in the subject outline were still relevant.

She also wished she could get more information about next semester's subjects before having to make her selections.

Here are some of Angela's comments from her first few weeks at University:

* it hit me then. This was my first day at uni, a dream I had previously thought would never come true! I had done it! I was beginning to take a journey, one that would have many challenges ahead, but one that would be fulfilling and worthwhile, both to me and hopefully my students both now and in the future.

* I must ask the lecturer if I can have that sort of thing early if it's possible. I need to read it in front of me, rather than have a class member read it out because I can't contribute to the group discussion half as much as I would like, if I have to listen to someone read to me.

* I was struggling to concentrate. It's really hard in group settings because everyone's talking at once! Maybe I'll have to take the microlink next time, or perhaps directional mikes might work, not sure! Will have to play around with that a bit to see what works best.

* I'm really pleased that the lecturer got to stay with the class because I was able to email him and let him know my situation before I arrived and this made things a lot better. I've studied in courses before and haven't let key people know when I'm having difficulties hearing and in the end, this only makes things worse for me. By my previous experiences I have learned, though it's not that easy, to speak up and not to pretend when I'm struggling to hear. Letting someone know in advance can really help and it sure did today!

* One of the other things I did was to bring the SmartLink to class. Wow! What a powerful tool! I only had the one BAHA but I sure was able to make better use of it with the Smart Link. When we had group discussions I put it in between myself and the group on the table and it was just great! Next time I might try handing it around as each person speaks though because the transmitter was picking up a lot of the sound from the other groups and I didn't really need that! Still, the lecturer could move around the room a little and I could still hear every word he said. The Smart Link will definitely reduce my tiredness levels which is fantastic!

* I'm glad I pre-warned my lecturers that I was not going to be able to hear too well, that made a lot of difference to how the day turned out! My attitudes too, are slowly changing. As I gain more experience and "learn the hard way" at times, it just gets easier as time goes by and as I learn to learn from my mistakes.

* I still came out loving it, which is the main thing and also the thing that will carry me through!

LEARNING RESOURCES

The development of the training resources requires a flexible approach allowing for students to have a variety of options. The key to good resources is an ability to produce them in different ways or modify as required, to ensure accessibility and to meet the needs of each individual.

1. Plain English and alternative formats

The biggest obstacle for some deaf students is the English language and they require the language of handouts to be in plain English. Students with low vision or who are blind, require brief concise notes because their reading is often quite slow.

Flexible delivery of higher education and computer technology has opened enormous opportunities for people with deafblindness. It is now possible to access resources in a wide variety of formats. It is important however, that individual preference should be considered. A deafblind student may prefer print, electronic or Braille format for handouts. The file format for electronic handouts is an important consideration.

Most subjects use a vast vocabulary of new words so much time is required in introducing the terminology to students. A glossary is important to introduce the definitions of words and also their accompanying sign language which may need to be researched by the interpreter. Where possible it is important for students to learn by "touch." For example in learning about computer hardware, it helps to get a good look at the hardware via "touch" to assist in their understanding of the terms.

2. Print

These can now be customised and can be printed in a specific size, font style, and colour and even on different coloured paper. It is best to consult the student on their preferred font colour and size as it will vary from person to person.

3. Electronic

Computers now will easily convert files from one format to another. The student will have a very specific requirement for reading electronic files for example Word, Plain Text, Html or PDF.

Individual teachers should take responsibility to ensure their handouts are accessible. They may need to consult with their technical staff to learn how to save a file in the required format but it makes a big difference to the student if the handouts are accessible when they receive them.

It is also a good idea, where possible, to make them available to the deafblind student prior to class so they have an opportunity to read it at their own pace. This can be achieved with email, disks or memory sticks, or by uploading to the student Intranet.

4. Braille

Some students will prefer Braille materials and it is possible to request handouts be translated into Braille by an external agency like Vision Australia. Long lead times are required. Where possible it is best to send electronic copies of text to be translated into Braille as this will speed up the process.

In some cases the students themselves will be able to print their materials in Braille, but be aware that diagrams, pictures, and columns may require expertise in translating into Braille. It is important to note that one page of text is equivalent to two or three pages in Braille. The Braille paper is quite thick so a student wouldn't want to carry around, let alone store, ALL their work in Braille.

One cannot assume the student is in a position to easily transfer all their work into Braille. It is best to save a document as plain text and ensure it can be understood rather than presented in complex tables.

5. Scanning

It is possible to scan learning resources and either read them on the computer or print them in Braille. This provides independence and access for people who are deafblind. However, much time is involved in scanning large amounts of work and when text is translated with OCR there can be a lot of work involved in "tidying" up. It is always best to source the original work on disk format, which is becoming easier. Many books now provide resources online to complement the tasks in the book and increasing numbers of books are becoming available in electronic format.

6. e-learning Platforms

TAFE and Universities are now providing access to course materials via an online platform for example WebCT, Blackboard or an in house Content Management System. Due to the fact these are housed in the Internet, their accessibility can be cumbersome. When developing online resources it is important to follow the accessibility guidelines as set out by World Wide Web Consortium.

Blackboard has a Tutorial for Screen readers at
http://library.blackboard.com/docs/screen_reader_tutorial_release_6.htm

The development of online resources is still relatively new within educational communities and the formats and styles are changing rapidly along with new developments in technology. Higher Educational institutions now have many of their learning materials and assessments available online.

Students can enrol flexibly and choose to attend all classes, some classes or no classes. Flexible delivery offers the ideal opportunity for trainees with deafblindness to decide the pace and place of their learning. Online delivery of training is an ideal solution which gives people with deafblindness the opportunity to learn at their own pace and on their own computer and to have a wide range of training options available. Flexible delivery gives students the choice of classroom participation or learning online or a combination of both. Some may choose an alternative venue, which can provide adaptive technology or support staff. However, keep in mind that for some students, the experience of study is to take them into the classroom to interact and meet new people. Whilst having access to class materials online they may not want to study exclusively online.

Universities and TAFE use a variety of Content Management Systems for the production of online learning materials. Two popular systems are Blackboard and WebCT.

Work must be done to ensure the online format is compatible with the low vision display options and with the screen reader. There are many resources available on the Internet to assist in ensuring accessibility of training resources and further information is available in the Accessibility Guidelines of this Resource.

7. Real time Chat Programs

Chat programs, including the standard chat facility within Blackboard and WebCT have limited accessibility with screen readers and hence Braille or voice access. Very few are able to change font size and colour. Even when these accessibility measures are in place, the sheer pace of the conversation may restrict the ability of deafblind students to participate fully.

8. Web Mail

Web Applications include Web mail and online learning environments. Often Web mail can be difficult to access compared to a dedicated email program like Outlook Express with built in shortcut keys. This can be overcome by setting it up so that all emails are forwarded to a regular address. Outlook Web mail is a program that is very difficult to access with a screen reader as it is has no keyboard navigation.

CUSTOMISING COMPUTER SETTINGS

Specialist Adaptive Technology is added to a standard PC to enable the deafblind person to "see" the screen and this is usually screen magnification software and/or screen reading software with either Braille or voice output. The deafblind person inputs text and commands in the standard way, either via the mouse and/or the keyboard.

Where a deafblind person has good functional low vision they can sometimes use the accessibility features of Microsoft. Computer instructions need to be in a language that makes sense to the way the trainee accesses the computer. Some trainees will prefer to point and click, requiring steps written to identify mouse commands and icons. Some trainees will be using a screen reader and will need the steps written as keyboard commands. Combining all these elements is a considerable challenge and requires an ability to produce notes according to individual requirements. It may be necessary to find alternative materials for students to meet their specific needs.

In offering training for people with deafblindness, an overall technical understanding of the adaptive technologies is essential to avoid conflicts in their settings so that changes made for low vision clients do not impact on the screen reader software and vice versa. Good relationships with the technical staff are important to ensure equipment is installed and configured appropriately. Fine-tuning and trouble shooting is required for the adaptive technology in the initial stages. Lead times and testing are required. A commitment to research and upgrading the adaptive technology is also required, to keep up with the ongoing upgrades of mainstream software. Adaptive technology has excellent online help provided within their software.

1. User Profiles

Customised user profiles give true independence to a student who is deafblind. They can turn on the computer on and be confident it will be accessible as their settings will be automatically loaded. Alternatively the trainee can use their own laptop and classrooms now have the provision for wireless connection to the network via laptops.

Customised User Profiles can save the following customised settings:

- Display Settings - Background and text colour and sizes which hold for all application programs
- Mouse Pointer – size, colour, animation
- Mouse Button zoom feature
- Desktop icons
- Taskbar and Start menu Options
- Startup programs eg screen reader activated at logon
- Email accounts
- Internet Favourites folder
- Folder Options

2. Microsoft Internet Explorer

- Ignore Colour, Font size and style specified on Web Pages (Tools, Options, General, Accessibility)
- Set Text, Background, Link and Hover colours (Tools, Options, General, Colours)
- Select Font style (Tools, Options, General, Fonts)
- Customise "Advanced" options as specified by a screen reader (Tools, Options, Advanced)
- Change Text Size (Control Plus and Control Minus)

SCREEN MAGNIFICATION

Windows Display Settings

It is possible to customise the size and colour of all text including Menus and Title Bars. These settings will "hold" for most application programs and can be selected to override the individual display characteristics of Web pages. Many application programs include text magnification and the option of enlarging icons on Toolbars. The default Display resolution can be changed to increase the base font size in all applications.

Windows Magnifier

Microsoft Windows Magnifier enables you to enlarge a portion of your computer screen in a separate window to make it easier to see. You can select magnification levels up to 16 times the original size, and you can choose to track the mouse, the keyboard, or text editing.

Magnifiers

There are many shareware screen magnification programs which operate in the same way as a hand held magnifier. They can by "picked up" by the mouse from the taskbar to read on screen text but disappear when an action is performed. They are available to download at *http://www.magnifiers.org.*

A mouse can have additional "buttons" which can be configured to perform different tasks and these preferences are selected in the Control Panel and saved in the individual user profile. Features include text magnification, wheels that make scrolling easier, snap to default button. There is also shareware software available, which changes the size and colour of the mouse pointer. *http://www.magnifiers.org*

Specialist software programs are available which magnify the text on screen. These are integrated software programs which support the magnification of all text within all application programs. They will easily track the cursor or mouse and boast a variety of features which enable different sizes, colours and magnification windows. Popular programs are Zoomtext and BigShot from *www.aisquared.com* or Magic from *www.freedomscientific.com.*

Large monitor

Screen magnification can also be achieved with the use of a large monitor. Often, the zoom features available within applications combined with customised display settings are sufficient on a large monitor.

Closed Circuit TV (CCTV)

This is a stand-alone piece of equipment for magnifying text and is used to read small print in phone books, newspapers and training notes. Information about the range of CCTVs is available at *www.telesensory.com/frames.html* (see picture to the right).
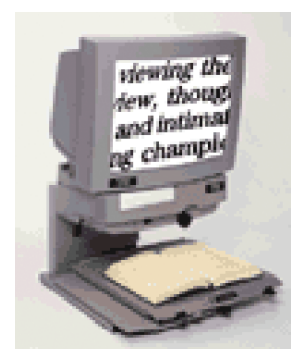
SCREEN READER

Microsoft Speech Software

Microsoft has an inbuilt screen reader called Narrator. It works with Notepad, WordPad, Control Panel programs and Internet Explorer. At this stage, it does not work with Braille but it's great for students who have some functional vision and good hearing, but are slow at reading long documents and the Internet.

Screen Reading Software

Specialised software is used for reading the screen and it has voice and includes drivers for Braille output. Deafblind people who have no functional vision use this with either Braille or voice output or both.

This software is very sophisticated and it relies on accessing all commands via the keyboard. It has full functionality with most Windows applications although non-standard applications have varying degrees of success.

The software has special "script" writing for all popular mainstream programs. The Screen reading software is from America and demo copies can be downloaded from the Internet at *www.freedomscientific.com* for Jaws and *www.gwmicro.com* for Window Eyes.
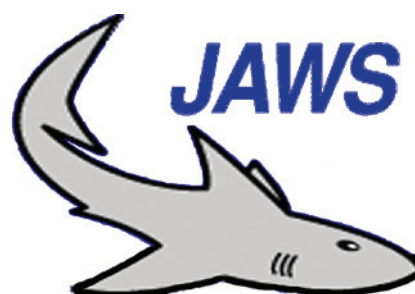
Braille Display Hardware

The Braille Display is attached to the computer and will display the screen text in "refreshable" Braille which constantly updates itself with new information as the user moves around the screen. Braille Displays require an associated screen reader software such as Jaws. They can be 20 cells, 40 cells or 80 cells depending on affordability. Information about the Power Braille Display is available at *www.freedomscientific.com*

DESIGN GUIDELINES

The following is a brief list of Accessibility Guidelines for online resources and software development:

- Support standard system size, color, font, and input settings
- Ensure compatibility with the High Contrast option
- Provide documented keyboard access to all features
- Provide notification of the keyboard focus location
- Convey no information by sound alone.

Web Accessible Toolbar

http://www.visionaustralia.org.au/info.aspx?page=614
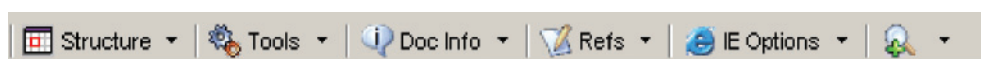
The Web Accessibility Toolbar has been developed to aid manual examination of web pages for a variety of aspects of accessibility.

 The World Wide Web Consortium has a Web Accessibility Initiative at *http://www.w3.org/WAI/*. Able Australia Services can be contacted to assist with testing online materials.

Accessibility Forum

The following guidelines are recommended: *http://www.accessifyforum.com*

- Test with the High Contrast option and High Contrast appearance schemes
- Test compatibility with extra-large appearance schemes
- Ensure all features can be used without a mouse through documented methods
- Test with the Inspect Objects tool and with the Microsoft® Windows® Narrator accessory to verify that all screen elements are exposed and properly labeled
- Test with the Microsoft Magnifier to verify that the keyboard focus location is properly exposed during navigation and editing
- Test with commercial accessibility aides
- Test with changes to the system font size and number of pixels per logical inch using the Display Settings option in Control Panel
- Include people with disabilities and accessibility software vendors in beta tests
- Include people with disabilities in application usability tests
- Conduct surveys of application users who have disabilities
- Distribute free evaluation copies of the application to individuals with disabilities, disability organisations, and accessibility software vendors

AUSTRALIAN DISTRIBUTORS OF ADAPTIVE TECHNOLOGY

HumanWare *http://www.humanware.com*	HumanWare Suite 2, 7-11 Railway Street P O Box 944 Baulkham Hills NSW 2153 Phone +61 2 9686 2600 Fax +61 2 9686 2855
Quantum Technology *http://www.quantech.com.au/*	Quantum Technology Pty Ltd 5 South Street PO Box 390 Rydalmere NSW 2116 Phone: 02 8844 9888 Fax: 02 9684 4717 Email: info@quantumtechnology.com.au Quantum Technology Pty Ltd 3 Chesterville Road PO Box 5028 Cheltenham VIC 3192 Phone: 03 9545 4100 Fax: 03 9585 3977 Email: vic@quantumtechnology.com.au
Vision Australia Equipment Solutions *http://www.visionaustralia.org.au*	VisTech Vision Australia 201 High St Prahran VIC 3181 Phone 1300 84 74 66

SOFTWARE DOWNLOADS AND PRODUCT INFORMATION

SCREEN MAGNIFICATION SOFTWARE

    Shareware Magnifiers *www.magnifiers.org*

    Zoomtext and BigShot *http://www.aisquared.com/*

    Magic *www.freedomscientific.com*

VIDEO MAGNIFIERS

    ClearView CCTV - Quantum Technology. *http://www.quantech.com.au/*

    Smartview CCTV - Humanware *http://www.quantech.com.au/*

SCREEN READERS

    Jaws *www.freedomscientific.com*

    Window Eyes *www.gwmicro.com*

BRAILLE DISPLAYS

    PowerBraille *www.freedomscientific.com*

    Brailliant *http://www.humanware.com.au*

BRAILLE NOTETAKER

    Pacmate *www.freedomscientific.com*

    Braillenote *http://www.humanware.com.au*

BRAILLE EMBOSSERS

    Braille Blazer *www.blazie.com*

    Duxbury Software *www.duxburysystems.com*

SCANNERS and OCR

    Hp Scanner *www.hp.com*

    OCR Software Textbridge or Omnipage.

ACCESSIBILITY GUIDELINES

    Microsoft Enable *http://www.microsoft.com/enable/*

    The World Wide Web Consortium Web Accessibility Initiative *http://www.w3.org/WAI/.*

    Web Accessible Toolbar *http://www.visionaustralia.org.au/info.aspx?page=614*

    Accessibility Forum *http://www.accessifyforum.com*

    Blackboard Tutorial for Screen Readers

    http://library.blackboard.com/docs/screen_reader_tutorial_release_6.htm

CONTACT DETAILS

Able Australia Services
(Formerly The Deafblind Association)
616 Riversdale Rd
PO Box 1213
Camberwell, 3124
Phone 1300 225 369
TTY 03 9882 6786
Fax 03 9882 9210
www.ableaustralia.org.au

Able Australia Services (formerly The Deafblind Association) works to create a community where people with multiple disabilities including deafblindness are seen, heard, respected, valued and connected. We reach out to people with multiple disabilities including deafblindness, supporting them in achieving self-fulfilment and connection with the greater community.

Our services include:

- Able Deafblind Services
- Able Lifestyle Choices
- Able Living
- Able Respite
- Able Music Therapy
- Ablelink

Able Australia Services is passionate about making a difference to others. To find out more about our services, the people we support or how you can help, please contact Able Australia Services.

Biography of Claire Tellefson

Claire Tellefson has been employed as a Computer Trainer at Ablelink for nine years. Ablelink is an outreach program that provides internet access and training for the deafblind community in Australia. Her combination of skills, including Australian sign language (Auslan), Braille and adaptive technology, give her expertise in teaching people who are deafblind. Claire has been involved in computer training for seventeen years.

Claire also works at Swinburne TAFE (in Victoria) as a computer trainer in Business Administration and is involved in developing course materials for flexible and online delivery. She has extensive experience in the development of training resources and in training delivery.

Deafblind Resource Guide

Training people with deafblindness in using
Information and Communication Technology
A guide for TAFE, Universities and Community Educators

June 2007

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