Information Sheet on

Hearing Impairment & ICT

British Educational Communications and Technology agency

JULY 2000

About this information sheet

This sheet aims to provide you with:

- an introduction to the growing emphasis on the place of ICT for learners with hearing impairment (HI)
- a list of organisations, both voluntary and commercial, which provide information, advice, training, hardware or software relevant to students who have HI
- details of some of the published sources of information and advice on ICT and HI.

This sheet can be accessed on the Internet:

- in summary at: *http://www.becta.org.uk/technology/infosheets/html/hearing.html*
- in full as a pdf file at: *http://www.becta.org.uk/technology/infosheets/pdf/hearing.pdf*

Introduction

If you are working with children whose first language is British Sign Language (BSL), how on earth do you teach the phonics component of the Literacy Hour? This is just one of the issues that teachers who are working with deaf children have to face.

Literacy is a key concern because it is in this area that the language delay is most obvious. The average profoundly deaf adult has a reading age of about 8 and so is debarred from many education and training courses. In addition, many children with relatively minor or temporary hearing problems, such as glue ear, struggle with reading and writing in primary school and not only fall behind but also suffer an enormous loss of confidence.

Phonological awareness, the link between symbol and sound, is crucial to literacy development, but how can children access sound visually? In some cases, studying the shape of sounds on the lips might help, but lip reading can be ambiguous. The words *white* and *quite* for example are virtually identical on the lips and are often deciphered by context. How do you teach children to break a word into syllables when they can't hear it? The length of the word may not relate to the number of syllables: *beach* is monosyllabic while vid/e/o has three beats, yet both have five letters.

Writing is often quite a formidable task, and many pupils are overwhelmed by the effort to produce text in what for them is very much a second language. If a pupil can be enabled to embrace natural language alongside BSL by means of providing them both from the same point in the classroom, for instance a whiteboard with a signer standing alongside, then this can help greatly with inclusion. If, too, a pupil can learn to touch type whilst they watch the signer, they can get a great deal more from a lesson.

How can ICT help?

ICT is of particular value in developing the language experiences of learners with HI. ICT can be a very visual medium, with pictures, signs or texts on screen allowing pupils to extend both their general knowledge and use of language without being dependent on the spoken word. Learners who have a HI often need opportunities to extend their use of descriptive language in order to describe, compare and contrast objects: all skills that underlie effective information handling. Collaborating on an ICT activity can encourage a group of students to extend their use of language and their understanding of concepts as they plan and carry out their work.

The types of technology which are of most benefit to those with HI include:

- CD-ROM
- control software
- data logging
- Logo or turtle graphics
- multimedia
- whiteboards.

CD-ROM technology can provide hearing-impaired students with access to information in a more immediate and visual form than was previously possible. The opportunity to create multimedia presentations, by combining text, pictures and sound, can enable students to experiment with different methods of combining sound and vision. Where appropriate, the sound output can be linked to the enhanced amplification used by the student. These sounds become more meaningful when heard in conjunction with moving images on screen.

ICT can provide a first-hand experience to supplement and extend students' work without the students being dependent on text for structuring their ideas. For example, control software can be used to allow students to create and control a burglar alarm using a control box attached to the computer. Data logging software enables students to monitor the change in temperature of water in a beaker through sensors attached to the computer. Logo or turtle graphics provide a means of directing a floor robot or turtle through a maze by sending a series of instructions from the computer. Because all these are 'visual' as opposed to 'aural' there is less chance of misunderstanding.

Further details of what these technologies are and how they might help those special needs in particular are given on the general 'Special Needs and ICT' sheet.

What types of products can help with reading and writing?

A wide range of products are available to help HI pupils with reading and writing. The examples given below are for illustrative purposes but you should check on Becta's Educational Software database for fuller details on the products cited below and to obtain a wider range of software products: *http://vtc.ngfl.gov.uk/resource/esr/*

In terms of inclusion, you should note that many of the specific products to help with reading and writing skills are available both electronically and in print.

Reading

Some schools are using *An Eye for Spelling*, *THRASS* (Teaching Handwriting Reading and Spelling Skills), which focuses on working with individual words and looks at the 44 sounds of the English language. Pupils learn how to break down words and see how they are made up of combinations of sounds, but they are working on a visual not an auditory pattern. Other teachers swear by *Wordshark* and *Numbershark* and feel that they have enabled some pupils to make a real breakthrough.

Longwill School in Birmingham is spending two years developing visual phonics, with the intention of bringing sounds to life for deaf children in the way that *Letterland* has created personalities for individual letters. The letters are to be finger spelt and have a visual phonic clue as well.

Another bridge to literacy is to use the *Sign Graphics* program from SEMERC which enables teachers and pupils to put together body parts to create a still form of sign language. In this way, children can begin to relate the language they use for day-to-day communication to a written form on a page. All too often, children learn to sign and then approach reading and writing as their second language. With *Sign Graphics*, they can have immediate access to books and to the wonderful world of stories. As they begin to enjoy reading in their first language, they gain in confidence and become more independent learners.

Fun with Texts is recommended by many schools and can be used with any group, regardless of age, curriculum focus or language ability. Originally designed to teach foreign languages, including English as a second language, it is a framework program which allows learners to interact with text. At one level, it can be used to teach specific vocabulary and spellings as words appear on screen and

then vanish and the pupil has to type them in from memory. This is the basis of many spelling programs and is particularly good for checking and reinforcing half-remembered patterns. The joy of using *Fun with Texts* is that the teacher controls the content. Alternatively, you might choose to create 'cloze' passages, where words are omitted and replaced by blanks. You can choose to jumble up the lines of text and let the pupil put them back in sequence. This is a good way of checking that the pupil is reading for meaning. Most daunting of all, when a child is familiar with a passage, perhaps from a familiar story or from one of the Literacy Hour Big Books, you can choose the prediction option. The package gives a choice of words, usually six, and you rebuild the text bit by bit by selecting the words. This process helps develop an awareness of syntax and which words follow on from each other.

Writing

To assist with writing there are a number of useful facilities available, some very reasonably priced, others definitely top of the range!

Software

Some years ago, Becta ran a project in further education colleges looking at *Co:Writer,* a sophisticated predictive package, to see how it might help deaf learners. It puts up a list of suggestions on the screen which have been generated either from the first letter typed or through grammar, by predicting common word combinations. For example, *A lot* is likely to be followed by *of.* There are some obvious advantages: Words are always correctly spelt and pupils can choose words which they know – words which, perhaps, they would not naturally call to mind and thus they extend their active vocabulary, experiment and become more ambitious.

TAG Software has produced *HomeMapper*, *BodyMapper* and *WeatherMapper* for Apple, Acorn and PC, which allow pupils to engage with the content and collect ideas or evidence to write in a structured way. There are many options. In the *HomeMapper* program pupils can go inside and outside the house, where all the parts are labelled to improve vocabulary. They can learn about the materials we have in our homes, about safety aspects, and compare their own kitchen or bedroom at home with the one on screen. Pupils can write their own notes and add to the database alongside other pupils. Best of all, the text is available for every screen at two different levels, so reluctant readers can work with the shorter sentences and easier vocabulary but there is an option for more sophisticated text as their reading progresses.

Inspiration, from Inspiration Software, has proved a useful tool for dyslexic learners and now that it is becoming commonplace for deaf learners to take written examinations, they too are having to plan and carry through larger-scale projects. *Inspirations* is a different approach to thinking and planning techniques, with learners using visual organisers, webs and mind maps to help them to keep track of what they are doing.

Hyperstudio, from TAG, is an example of a versatile multimedia program which can be used to pull a variety of resources together so that you can have scrolling text for subtitles and video clips of signing, together with still pictures, text and sound. One of the most striking uses of this program is *Elmer,* produced by the BBC and TAG software, the first Living Book created specially for deaf readers.

In terms of CD-ROMs, there have recently been a number developed to support the acquisition of BSL. These can help people who want to learn BSL much as they might learn French or another foreign language. They can also help deaf children who are struggling to communicate in BSL. They can also, as in the case with Manchester City College's new CD-ROM of Maths Signs, help to standardise the signs for particular concepts thus relieving lecturers from the need to create new signs. The college consulted experts who were not only knowledgeable about their particular curriculum areas but were also born deaf and had used British Sign language from very early childhood. In this way, technology has become a way of extending and developing good practice and providing a permanent visual record of language which can be used nationwide.

Sign Now! Is a different type of dictionary with over 3,500 signs, including some regional variations, and you can access a sign by typing in or clicking on a word or by clicking on a handshape. You can try the quiz or learn new signs by watching the relevant video clips which can be slowed down or freeze framed.

SIGN-IT! from Sign Communique Ltd is the nearest thing to a course on disk. It has over 200 video clips of conversations on topics which students need to study for stage 1 and stage 2 exams. Just as learners of other languages need to move from single words to phrases to the creative use of language to communicate, so BSL users need to get to grips with conversations signed at normal speeds.

Coming soon from the Scottish Sensory Centre is a CD-ROM for teenagers, designed to keep them 'healthy, safe, sexy and sharp'. Designed for both deaf and visually impaired learners, the idea is to give them access to information which they might otherwise miss. The Royal Blind School in Scotland have done voice-overs working from Braille, and Donaldson school have done the signing. It will be available next summer and will be freely distributed to schools in Scotland. It covers contraception, safe sex and drug use. It is a bright, visually attractive site which is a welcome addition to the area of PSE. Also in Scotland, the National Deaf Children's Society has been awarded a substantial grant to run technology-based training events, launch a Web site and produce a CD-ROM of children's stories with text and signing.

Hardware

At the top end is the *Smartboard*, an interactive whiteboard which works in conjunction with a computer and projector. Some schools use them simply as a glorified chalkboard, but this is a very expensive option! To activate the board the computer is instructed to load up the software and then the user chooses one of the four different coloured pens and draws on the board, which can then be wiped clean with a magic eraser. You can use your fingernail as a mouse to drag pictures and other objects around the board. In recent trials, staff thought the board had a real 'wow' factor and would impress students They liked the fact that it was a brilliant demonstration tool because pupils did not have to listen and interpret instructions but could see what was happening. One advantage is that everyone is looking in the same direction, whereas if children are writing or using a computer they are looking down and miss signing or body language or additional explanations. With the *Smartboard*, you can tell that everyone is looking at the right piece of information.

On the other hand, some staff found that, in a light classroom without blackout facilities, it was not always easy to see the board. Also, since the projector puts out a beam which it is all too easy to stand in front of thus casting a shadow across the board, it might not be ideal for use with young children. In addition, the board is so lit up that it might detract from the speaker making it harder to lip-read.

Pictures are important to deaf learners, but up until now digital cameras have been expensive and teachers have worried about giving them out to children who may not take care of them. Now, however, prices are in the region of £50-£70 for a 'cheap and cheerful' camera, making this equipment more within reach. Obviously, such a camera does not provide top-quality resolution, but then you don't really need that. This is not for glossy brochures but for sports day and work in progress – in other words, not the 'posed', end of project work. Think of it like a calculator: get it out of the cupboard every lesson and use it.

The use of digital cameras with *PowerPoint* is revolutionising classroom practice. Mike North has been developing Photo Stories with the English Department at RSD Derby, and the children are using *PowerPoint* as a means of recording their experiences. Why word process a document, print it out and then have people read it whilst the teacher is signing or a pupil is trying to lip-read? Using *PowerPoint*, everyone can see the presentation *and* the teacher as well. Also, the teacher can control what pupils are looking at, whereas on paper pupils will always be on different paragraphs to one another.

Additional considerations for learners with HI

It is important for all those working with the student to agree on the rationale for using an ICT solution. Training opportunities and time for liaison and review need to be considered if the use of ICT for an individual child is to be fully effective.

An ICT solution must be matched to the needs of the individual. Physical difficulties, poor motor control or visual impairment can all combine with HI to affect the educational objectives for the student and thus influence the role of ICT in their learning. A full assessment of the child's strengths and weaknesses in the context of the classroom is an essential first step.

Can ICT help the HI to communicate at a distance?

Becta and BT worked with Deaf@x to develop literacy skills in deaf children by partnering them with a hearing adult. The original project targeted seven schools and one college. Writing and communicating need to be an active process, and people talk and write better if they have a receptive audience and get some feedback.

Staff reported improvements in grammar, drafting skills, syntax, punctuation and vocabulary. Social interaction became important. Many were writing to an adult as an equal for the first time, using language to convey and elicit information. In many cases they were exchanging personal information and asking questions instead of always trying to answer them!

Now Deaf@x are working with children in India in a two-year programme to share good practice in the UK between teachers, parents and experts in the fields of literacy and total communication. They will be linking up to enclose the use of telecommunications and the Internet to train deaf children to improve the literacy and communication skills of deaf children around the globe. When you think that in the past some BSL users never communicated with anyone who was not in the same room as them, it is amazing the difference that technology has made.

Publications

You should check the Bookshops link under 'Internet sources' (below) for a wider range of publications.

A Review of Good Practice in Deaf Education by S. Powers, S. Gregory (et al)
RNID 1999
Reports on a project which was run by the Universities of Birmingham and Manchester.
RNID Helpline Tel: 0870 60 50 123 Textphone: 0870 60 33 007, or
Forest Bookshop Tel: 01594 833858 (voice/minicom)
http://www.bham.ac.uk/education/research/gprdeaf/200.htm

Special Needs and ICT information sheet
Becta. 2000 *Free*
http://www.becta.org.uk/technology/infosheets/html/senict.html
Details generic special needs and ICT information. In particular, different types of software and hardware which can help, and lists of other sources of information such as organisations, publications and software.

Software

You should check Becta's Educational Software database for fuller details on any titles cited below and to obtain a wider range of software products: *http://vtc.ngfl.gov.uk/resource/esr/*

Organisations

General

Please note that, for brevity and ease of maintaining these sheets, the details of these organisations, central to the whole field of Special Needs, are given only in brief on this sheet, with the full details held on the main special needs information sheet entitled 'Special Needs and ICT'.

ACE (Aiding Communication in Education) Centre Advisory Trust

Specific to HI

British Association of Teachers of the Deaf (BATOD)
21, The Haystacks, High Wycombe, Buckinghamshire HP13 6PY
Tel: 01494 464190 Fax: 01494 464190 E-mail: secretary@batod.org.uk
http://www.batod.org.uk/
Represents the interests of teachers of the deaf in the UK. Organises regional and national meetings to promote issues connected with the education of hearing-impaired children. Publishes a journal and association magazine.

British Deaf Association (BDA)
1-3 Worship Street, LONDON EC2A 2AB
Tel/text: 020 7588 3520 Fax: 020 7588 3527 E-mail: info@bda.org.uk
http://www.bda.org.uk/
A democratic, membership-led, national charity campaigning on behalf of deaf people in Britain. The British Deaf Association has several main service areas, with teams covering education and youth, information, health promotion, video production and community services, offering advice and help.

British Royal Sociey for the Blind Dual Sensory Loss Service (BRSB)
Still House Lane, Bedminster, BRISTOL BS3 4EB
Tel/Minicom: 0117 953 7750 Fax: 0117 953 7751 E-mail: BRSB@compuserve.com.
Provide information services for deafblind people, and a library of over 70 topics available on request in any language or format.

Council for the Advancement of Communication with Deaf People (CACDP)
Pelaw House, School of Education, University of Durham, Durham DH1 1TA
Tel/text: 0191 374 3607 Fax: 0191 374 3605 E-mail: durham@cacdp.demon.co.uk.
Promotes communication by offering assessment and accreditation in British Sign Language (BSL) and other forms of communication used by deaf people. Their publications include a directory of sign language interpreters and other human aids to communication, exam curricula and student videos.

Deaf@x Trust
Technology Centre, Bulmershe Court, The University, READING, Berkshire RG6 1HY
Tel: 0118 926 0259 Fax: 0118 926 0258 Text: 0118 926 0257 Video: 0118 935 3574
E-mail: 101331.1044@compuserve.com
http://www.webcom.com/deafax/page2.html
A UK charity set up to give deaf people access to all forms of communication and encouragement to become expert in their use. The Web site, *De@fax: Working Together With Communication and Technology*, is a resource provided by deaf and hearing people for deaf and hearing people.

Deafblind UK (The Association of Deafblind and Dual Sensory Impaired People)
Head Office, 100 Bridge Street, PETERBOROUGH PE1 1DY
Tel/Minicom: 01733 358100 Fax: 01733 358356 E-mail: info@deafblind.org.uk
Helpline: 0800 132320
Technology Services: Tel: (text/via Typetalk) 01733 358991 (Typetalk linkline 0800 515152)
E-mail: hasicom@deafblind.org.uk.
A charity providing many services, including a 24-hour free helpline and communication skill training for workers with deafblind people. Other important services are the Usher Syndrome Project run by the Scottish office of Deafblind UK, and the Technology Services Section dealing specifically with access to ICT. Technology Services is based at the head office. Scottish office details are given below.

Deafblind UK (Scottish Office)
21 Alexandra Avenue, LENZIE G66 5BG
Tel/Minicom: 0141 777 6111 Fax: 0141 775 3311 E-mail: info@deafblindscotland.org.uk.
E-mail : s.joyce@deafblindscotland.org.uk
Stephen Joyce is the co-ordinator for the Usher Syndrome Project.

National Deaf Children's Society (NDCS)
15 Dufferin Street, LONDON EC1Y 8UR
Tel: 020 7490 8656 Fax: 020 7251 5020 E-mail: helpline@ndcs.org.uk
The NDCS exists to enable deaf children to maximise their skills and abilities. It provides advice, information and training primarily to parents and carers.
http://www.ndcs.org.uk/

Royal National Institute for the Blind (RNIB)
224 Great Portland Street, LONDON W1N 6AA
Tel: 020 7388 1266 Fax: 020 7388 2034 E-mail: CServices@rnib.org.uk
http://www.rnib.org.uk/
RNIB do a fact sheet on the deafblind manual alphabet, available on their Web site at:
http://www.rnib.org.uk/wesupply/fctsheet/dbmanual.htm

Royal National Institute for the Deaf (RNID)
19-23 Featherstone Street, LONDON EC1Y 8SL
Tel: 020 7296 8000 Fax: 020 7296 8199 E-mail: helpline@rnid.org.uk
http://www.rnid.org.uk/
The RNID provides training and support, and promotes technology for deaf people.

Scottish Sensory Centre
Moray House Institute of Education, Holyrood Road, EDINBURGH EH8 8AQ
Tel: 0131 651 6501 Fax: 0131 651 6502
http://www.ssc.mhie.ac.uk/
The Scottish Sensory Centre promotes and supports new developments and effective practices in the education of children and young people with sensory impairments, i.e. visual, hearing or dual (deafblindness) sensory impairment.

The Visual Language Centre (VLC)
Room B310c, School of Languages and European Studies, University of Wolverhampton, Stafford Street, WOLVERHAMPTON WV1 1SB
Tel: 0902 322664 Fax: 0902 322739 E-mail: M.J.Davies@wlv.ac.uk
http://www.wlv.ac.uk/sles/vlc/
Established in January 1991, the VLC has a role supporting deaf students on a wide range of degree courses where communication methods are used which are appropriate to each individual's needs. It aims to help deaf and HI people to gain access to higher education. The Centre also develops and provides special courses to enhance communication between deaf and hearing people, by analysing the problems of deafness and developing skills such as signing.

Equipment suppliers

BBC Educational Publishing
Room 3408
White City
LONDON
W12
Tel: 020 8752 5261
E-mail: Sally.lovell@bbc.co.uk

Don Johnston Special Needs Ltd
18 Clarendon Court
Calver Road
Winwick Quay
WARRINGTON
Cheshire
WA2 8QP
Tel: 01925 241642 Fax: 01925 241745
E-mail: jmunro@djsn.u-net.com
http://www.donjohnston.com

The Forest Bookshop
8 St John Street
COLEFORD
Gloucestershire
GL16 8AR
Tel: 01594 833858/01594 833334
Minicom/TTY:01594 833858
Fax: 01594 833446
Videophone: 01594 810637
E-mail: deafbooks@forestbooks.com
http://www.forestbk.demon.co.uk/system/shopassistant.htm

Lander Software/REM
Great Western House
LANGPORT
Somerset
TA10 9YU
Tel: 01458 254 700 Fax: 01458 254 701
E-mail: info@landersoftware.com

London Educational Technology Support Service (LETSS)
The Lodge
Crown Woods
Ryfield Road
Eltham
LONDON
SE9 0AQ
Tel: 020 8850 0100 Fax:020 8850 0400
http://www.letss.com/

Penfriend Ltd
30 South Oswald Road
EDINBURGH
EH9 2HG
Tel: 0131 668 2000 Fax: 0131 668 2101
E-mail: admin@penfriend.ltd.uk
http://www.penfriend.ltd.uk/

The RESOURCE Centre
51 High Street
Kegworth
DERBY
DE74 2DA
Tel: 01509 672222 Fax: 01509 672267

Tag Developments Ltd
19 High Street
GRAVESEND
Kent
DA11 0HU
Tel: 01474 357350 Fax: 01474 537887
http://www.tag.co.uk

Widgit Software
102 Radford Road
LEAMINGTON SP
Warwickshire
CV31 1LF
Tel: 01926 885303 Fax: 01926 885293

Internet sources

There are many Internet sources which may be of help, and the URLs are cited alongside the organisation, publication or other source to which the site pertains. This section is limited to sources believed to be available only via the Internet, or foreign sites where access will be greatly eased by making use of the Internet.

General

For brevity and ease of maintaining these sheets, the details of Internet sources central to the whole field of Special Needs are given on the 'Special Needs and ICT' sheet rather than repeating them on each specific sheet. Some of those general sources may also be able to provide you with assistance.

Specific HI Sites

http://www.deafblind.co.uk/
A deafblindness Web resource giving information from Internet resources to conferences and courses, equipment, service providers, bibliography etc.

http://www.deafblind.com/
An A-Z to Deafblindness in several languages, giving information ranging from resources on the Internet to organisations, courses and equipment suppliers. Also shows the Deafblind Manual Alphabet.

Deaf World Web
http://www.deafworldweb.org/
A resource for individuals and deaf communities world wide.

SEMERC
http://www.semerc.com/
a guide to special needs software – much of it can be used with deaf children

St Johns Catholic School for the Deaf
http://www.stjohns.org.uk/
Highly commended by Becta in their Web site awards 1999.

Teletext
http://www.teletext.co.uk
A good reliable source for news