Information Sheet on

Dyslexia and ICT

British Educational Communications and Technology agency

JULY 2000

About the information sheet

This sheet aims to provide:

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

This sheet can be accessed on the Internet:

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

Introduction

ICT can motivate learners with specific learning difficulties, including dyslexia, to acquire specific skills for reading, spelling, writing, and maths skills, as well as giving more general support in the curriculum. ICT offers a whole toolkit of strategies to help learners with dyslexia, from simple word processors to speech recognition, CD-ROMs and the Internet.

According to Joanne Rule, chief executive of the British Dyslexia Association:

'*If dyslexia was better catered for within all mainstream schools, we could avoid the massive problems of behavioural difficulty, poor self-esteem and underachievement highlighted by Channel 4.'*

ICT has certainly been shown to help with both dyslexia and with EBD.

What is Dyslexia?

According to the Dyslexia Institute:

> *'Dyslexia is a specific learning difficulty that hinders the learning of literacy skills. This problem with managing verbal codes in memory is neurologically based and tends to run in families. Other symbolic systems, such as mathematics and musical notation, can also be affected.'*

This definition exemplifies the nature of the problem faced by an estimated 350,000 pupils in the UK.

The existence of dyslexia as an identifiable condition has been questioned, however. Many prefer the term 'specific learning difficulties' because they feel it is a more accurate description of the pattern of difficulties frequently experienced by this group of students. These difficulties include marked and unexpected discrepancies between general intelligence and the ability to perform tasks; particularly those involving language, reading or writing. Dyslexic-type difficulties will certainly include difficulties with one or more of the following:

- auditory discrimination
- left and right
- maths computation
- memory
- organisation
- pronunciation, particularly of words of three or more syllables
- reading
- sequencing

- spelling
- visual discrimination

However, this list is not to suggest that all students displaying these difficulties necessarily have dyslexia. Many of these difficulties are experienced by students with learning difficulties, whilst learners with dyslexia do not have other more general learning difficulties. Other reasons for displaying the types of difficulty often attributed to dyslexia include:

- innate/developmental problems – possibly genetic in origin
- head injury/stroke or illness
- physical disability, cerebral palsy or lack of educational opportunities.

What types of ICT can help?

There are a number of technologies that are of particular use when working with students with dyslexia or dyslexic-type difficulties. Most notable of these are:

- cloze procedures
- planning tools
- speech reproduction and synthesis
- spell checkers, glossaries and thesauri
- visual display customisation
- word processors including predictive word processors.

Details of what these technologies are and how they might help those with special needs generally are given on the general 'Special Needs and ICT' sheet.

How can ICT help?

A range of software now exists to help learners to organise their thoughts, develop their memory skills, expand their creative writing and produce work which reflects their ability. But, as with other strategies, software needs to be chosen with care.

Broadly, ICT can help in three key areas where students with dyslexia or dyslexic-type difficulties are concerned:

- supporting effective learning generally in all areas of the curriculum
- providing strategic techniques to help with particular difficulties
- enabling specific skills training.

Supporting effective learning generally in all areas of the curriculum
This area can be subdivided into:

- assessment
- multisensory approaches
- general strategies.

Assessment
Assessment can be aided by ICT; the British Dyslexia Association (BDA) provide information on tests which are available for different skills. Some have an ICT format – for example, the *Cognitive Profiling Systems (CoPs) Baseline Assessment*, a software product which is accredited by the Qualifications and Curriculum Authority (QCA) and produced by Hull University and Lucid Research Limited. This product is designed to assess children when they first enter school, and produces reports which show a child's individual strengths and learning needs.

Multisensory approaches
For over 30 years we have known that if dyslexic learners are to make progress they must have a multisensory approach, where they look, listen and touch. So what could be a better medium than a computer? Here they can access information through listening to digitised or synthesised speech instead of struggling to make sense of printed text. They can compose and plan and alter and edit without the stigma of illegible handwriting, and their work will bear the scrutiny of the most critical observer because, for once, it will be assessed on content instead of appearance.

However, with dyslexic learners there are important issues which are coming to light with regard to the use of speech input tools. On the one hand, teachers find that these packages are useful with adults in quiet settings such as the home or office but, on the other, some learners have major problems with 'enrolling' the software. Although packages are becoming simpler to enrol, even a small number of sentences needing to be read by the user, in order to help the software match voice to text, can be a trial for some pupils. They cannot read the test sentences fluently because the reading level is high and, to improve accuracy, particularly in the early stages, they need good proof-reading skills, which is one of the areas dyslexic learners often find difficult.

It is vital to keep things in perspective for dyslexic learners. It is too easy to fall into the deficit trap and for a pupil to see their work as a series of shortcomings. With the right ICT support, transcription is no longer an overwhelming problem and we can start to appreciate the syntax, vocabulary and sheer vitality of good writing.

The Accelerated Learning Centre at Stanbridge Earls School, as part of a recent DfEE funded Voice Recognition project managed by Becta (*http://www.becta.org.uk/inclusion/speechrecog/index.cfm)*, have been investigating the use of speech software with dyslexic secondary-age pupils. They used *Via Voice Executive* but found that the original enrolment script was too difficult for their students. They were invited by IBM to write their own script, which has a reading age of approximately 10 years

The results from Stanbridge Earls School were that:

- the speech of the user improved – slower and more distinct
- students could think through their ideas
- control of the PC gave pupils the ability and time to structure their thoughts
- pupils could bullet-point their ideas.

The software also:

- aided punctuation almost without pupils realising it
- encouraged proof-reading – so much more acceptable on screen and with corrections done by voice
- showed that the skill of following with a cursor and then using the playback to spot errors is important
- encouraged correct word recognition via the correction box
- offered pupils the freedom to use the vocabulary which they wanted to use rather than simply the words which they can spell

Edwina Cole, head of the Accelerated Learning Centre said that:

'Above all, we've appreciated the pleasure it affords students and teachers to enjoy language and even to enjoy it when they make mistakes. We've had such fun printing the recognition errors – so important when before mistakes only produced tension and a sense of failure.'

Voice recognition software is unlikely to be a panacea for all the problems experienced by dyslexic students. There is an array of technology which can help, but there is no magic solution. Teachers need to keep trying different approaches and to listen to the pupils to find out what works for them. Above all, it is vital to keep things in perspective for dyslexic learners. It is too easy to fall into the deficit trap and to see their work as a series of shortcomings. Computers can minimise the problems of handwriting and spelling; they can help with planning and composition. Once dyslexic learners have overcome these barriers, we will be free to appreciate the rich vocabulary, range of ideas and vitality of their writing.

General strategies

There is now a growing number of ICT aids to help with the learning of strategies to improve performance. Examples of software to help visual and auditory memory, include *Mastering Memory* (for Windows), from the Communication and Learning Skills Centre (CALSC). Programs which help study skills include a new program being *Wordswork* from Iansyst, designed for secondary and adult learners with dyslexia, and covering subjects as diverse as essay writing, revision, handwriting and time management.

Providing strategic techniques to help with particular difficulties
Examples of particular difficulties include:

- Dyslexia and mathematics
- Visual problems.

Dyslexia and Maths
Mathematical work presents particular problems to dyslexic pupils. 'Seeing' and 'doing' are the watchwords for teaching mathematics to dyslexic learners, without many verbal explanations. This helps to reduce other possible problems with memory and sequencing. ICT can assist in this area, with such products as *Number Shark* (Windows) from White Space, which has 30 games designed for learners with poor short-term memory, attention span and sequencing skills.

A calculator can prove a useful aid, not just to getting an individual answer right but also for learning particular products or number bonds. A calculator can encourage the estimation of answers, and a product such as the *Interactive Calculator* from Inclusive Technology, which has auditory feedback, physical manipulation, and a 'guess' button, can be particularly helpful.

Spreadsheets can help students with the recording of their work, giving good layout examples.

Visual problems
Visual problems give dyslexic pupils an added difficulty. Research has shown that black print on white paper is difficult to focus on for long periods, and some learners report that the words 'dance' on the page. With many packages, students can experiment with the background and text colours or alter the typeface and character size to suit their preferences. Double spacing can also help a lot.

Some people may also suffer from the 'Meares-Irlen Syndrome'. In the early 1980s Helen Irlen discovered a form of light sensitivity where the full spectrum of light causes distortions with print and the environment. She found that this could be treated with the use of coloured filters worn as glasses. More details on this syndrome can be found at: *http://www.tintavision.clara.net/*

Enabling specific skills training
There are different views about the application of specific skills training: there are those who believe that drill and practice letter recognition can be useful, whilst others believe that the best way forward is by writing meaningful and relevant material. There are also a number of activities that can help develop memory skills. These can be part of a drill and practice strategy or part of more open-ended activities. All activities in which students engage should be useful and have some personal relevance.

Drill and practice
The best drill and practice programs have sound so the learner can hear the spelling as well as see it. Letter patterns can be helpful, rather than phonics, which relies on memory. An example of a program using letter patterns is *An Eye for Spelling* from Rickett Educational Media.

Touch typing
While it is not essential to touch type to use a word processor or other software package, the increased speed and fluency can be very motivating, and composing becomes a less arduous task. For some students, the pattern of letters on the keyboard acts as a trigger to correct spelling. For example, the letters *w a s* are in a triangle on the left hand side of the keyboard, and after a while students automatically reach for those keys without analysing which three letters they are typing.

There is considerable evidence that students learn finger patterns on the computer, which in turn reinforce correct spellings. They are looking and choosing, building up letter strings and words rather than worrying about the orientation of individual letters. In this way they are developing and practising skills whilst composing.

Type To Learn, from Tag Developments Ltd, teaches students to type while reinforcing spelling, grammar, composition, and punctuation skills. *Touch-type, Read and Spell,* from Philip Alexandre, is a computer program based on the Hornsby *Alpha to Omega* scheme, which has provided a breakthrough for many students with dyslexic problems. All the vowels are learned first so that the learner is typing real words from the beginning. The screen can be customised to suit individual preferences. There is no negative feedback and nothing incorrect appears on screen. *Touch-type, Read and Spell* has over 600 short modules and some students manage ten modules in a session.

How might I develop a learning programme incorporating ICT?

There is no ready solution to the problems posed by dyslexia or dyslexic-type difficulties. You need to find out from the learner:

- What can he/she do successfully?
- How he/she learnt to do that?
- Can the strategies he/she used to learn that be applied to a new topic or set of skills?

Talk to your student and work together to plan a learning programme; they are the experts on dyslexia. Progress may be slower, but together you can overcome many of the problems.

Using a computer to lay out work in maths and science is possible, especially with word processors which include symbols and mathematical signs in their libraries. Drawing packages can be used to present graphics and geometric shapes. It is important to distinguish between an inability to lay out work clearly and misunderstandings in the mathematical concepts required to produce correct solutions.

Publications

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

Becta publications

Dyslexia and ICT: Building on Success
Illustrates, through case studies, how selecting the right tools within an overall plan for teaching and learning can help to overcome specific problems and build pupils' self-confidence. Included is a guide to choosing software to assess for dyslexia and other specific learning difficulties. Covers the early years through to further education.
Becta, 1999, ISBN 1 85379 436 8

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.

Other publications

Demystifying Dyslexia by Marysia Krupska and Cynthia Klein
A comprehensive introduction to dyslexia and the issues involved. Useful for staff training with photocopiable resource and activity sheets.
London Language and Literacy Unit, South Bank University, 103 Borough Road, LONDON SE1 OAA
Tel: 020 7815 6290

Dyslexia: a teaching handbook by Michael Thomson and Bill Watkins
Whurr Publishers, 1998 ISBN 1 86156 039 7
A practical handbook which is a general guide and provides teachers with the skills, techniques and structure to help children achieve success. The book takes account of the 1993 Education Act, recent research and other developments in the field.

Dyslexia by Pat Heaton and Gina Mitchell
Whurr Publishers, March 2000 ISBN 1861561792
A guide for students with dyslexia in further and higher education.

Dyslexia by Margaret Snowling
Blackwell Publishers, to be published 30 June 2000 ISBN 0631205748
This new edition considers the causes of reading and spelling problems, and how dyslexic children accomplish good levels of literacy. It covers the biology of dyslexia, recent research, and studies that evaluate teaching interventions.

Dyslexia: a Hundred Years on by T.R. Miles and E. Miles
Open University Press, 1999 ISBN 0335200346
An overview of dyslexia. It covers recent research and dyslexia in different languages, and looks afresh at assessment, teaching approaches and counselling.

Dyslexia – a Multidisciplinary Approach edited by Patience Thomson and Peter Gilchrist
Stanley Thornes, 1996 ISBN 0412596903

Dyslexia: a Parents' Survival Guide by Christine Ostler
Ammonite Books, 1999 ISBN 1869866134

Dyslexia and the bilingual learner: assessing and teaching adults and young people who speak English as an additional language by Helen Sunderland, Cynthia Klein (et al)
London Language and Literacy Unit, South Bank University 1999 ISBN 1872972446

Dyslexia and Information and Communications Technology by Anita Keates
David Fulton, January 2000 ISBN 1853466514
Practical advice to teachers keen to enhance their dyslexic pupils' access to the curriculum through the use of ICT. The author offers goals based on her classroom experience. Covers the hardware and software available and identifies those most suitable. ICT solutions to the problems of assessing and screening for dyslexia are provided.

Dyslexia and Reading by Jean Robertson
Whurr Publishers, December 1999 ISBN: 1861561369
Intended for those responsible for providing support for students with dyslexia. Gives an overview of neuropsychological theory and brain function. This is discussed in relation to the reading process and how this theory helps the development of specific intervention techniques.

The Dyslexia handbook 2000 edited by I. Smythe
British Dyslexia Association (BDA), 1999
This is an annual publication, available from the BDA, with up-to-date articles, resources, checklists and contacts for dyslexic learners and those who support them.

Dyslexia in context by Patience Thomson
Constable, to be published 26 October 2000 ISBN 009480 260 2

IEPs – Dyslexia by Janet Tod, Francis Castle, and Mike Blamires
David Fulton, 1999 ISBN 1853465232
This book is part of a series about individual education plans (IEPs) in significant areas of SEN, as detailed in the 1994 Code of Practice. It provides key principles, institutional self-reviews and ideas for action, with additional photocopiable INSET activities sheets and case studies. It considers IEPs as a way of involving the whole school in inclusive educational practice.

Getting started series
British Dyslexia Association
A series of practical booklets which explore the use of ICT to support students with specific learning difficulties. Individual titles include information on examinations, maths programs, spell checkers, and early literacy and numeracy skills. Available from the BDA and Dyslexia Computer Resource Centre.

The Psychological Assessment of Dyslexia by Martin Turner
Whurr Publishers, 1996 ISBN 1897635532
A guide to the many issues involved in psychological assessment, taking dyslexia to be a remedial cognitive deficit. The major tests in use for children and adults are also reviewed.

Pupils with specific learning difficulties in mainstream schools: a survey of the provision in mainstream primary and secondary schools for pupils with a statement of SEN relating to specific learning difficulties
Office for Standards in Education (OFSTED), 1999 Reference no. HMI 208
This report can be copied from the OFSTED Web site *http://www.ofsted.gov.uk,* or a hard copy obtained from the OFSTED Publications Centre, PO Box 6927, LONDON E3 3NZ
This survey covered pupils with dyslexia.

Software

You should check on 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 Dyslexia

British Dyslexia Association (BDA)
98 London Road
READING
Berkshire RG1 5AU
Tel: 01189 668271 Fax: 0118 935 1927
E-mail: info@dyslexiahelp-bda.demon.co.uk
http://www.bda-dyslexia.org.uk/
A national organisation providing support, advice and information on dyslexia. Use of technology is included, and there is a network of local BDA computer co-ordinators. Useful information on assessment tests. The Computer Committee organises computer activities and events. The Web site has details of events, publications and a computer advice service.

Dyslexia Institute
133 Gresham Road
STAINES
Middlesex TW18 2AJ
Tel: 01784 463851 Fax: 01784 460747
E-mail: info@dyslexia-inst.org.co.uk
http://www.dyslexia-inst.org.uk/
With centres, outposts and in-school units throughout the UK, the Institute offers educational and psychological assessments of children and adults, specialist tuition, teacher training and information. Provides courses at all levels for teachers and students. Published resources include the DI Guild journal, Dyslexia Review, and teaching resources including videotapes, books, and CD-ROMs.

iANSYST Ltd
The White House
72 Fen Road
CAMBRIDGE CB4 1UN
Tel: 01223 420101 Fax: 01223 426644
E-mail: sales@dyslexic.com
http://www.dyslexic.com
iANSYST Dyslectech attempts to provide an overview and a list of technology aids for dyslexic people. Has a particular emphasis on education – from early literacy to university and adult education. Offers an excellent range of software including voice input.

The International Dyslexia Association
International Office
Suite 382, Chester Building
8600 LaSalle Road
BALTIMORE
MD 21286-2044
USA
Messages (800) ABCD123, Voice (410) 296-0232, Fax (410) 321-5069
http://www.interdys.org/
Provides much useful information on dyslexia. The Web site has a 'Kids Only!' section which is full of ideas and information.

Irlen Centre Kent
Don Riley
17 Ashford Drive
Kingswood
MAIDSTONE
Kent ME17 3PA
Tel/Fax 01622 842764
E-mail: 101567.2412@compuserve.com
http://ourworld.compuserve.com/homepages/donriley/symp.htm
One of several centres for Meares-Irlen Syndrome, the full list being given on the Web site. The condition is explained on the site.

Scottish Dyslexia Association
Unit 3 Stirling Business Centre
Wellgreen
STIRLING FK8 2DZ
Tel: 01786 446650 Fax: 01786 471235
E-mail: Dyslexia.Scotland@Dial.Pipex.Com
The SDA is a voluntary organisation which aims to raise public awareness of dyslexia. Information, advice and support for dyslexics and teachers, parents and carers is available. Maintains close contact with the BDA.

Suppliers

Philip Alexandre
Touch-type, Read and Spell
PO BOX 535
BROMLEY
Kent
BR1 2YF
Tel: 020 8464 1330
E-mail: p.alexandre@ttrs.co.uk
http://www.ttrs.co.uk

Communication and Learning Skills Centre (CALSC)
131 Homefield Park
SUTTON
Surrey
SM1 2DY
Tel: 020 8642 4663
http://www.calsc.co.uk/home.htm

Don Johnston Incorporated
18 Claverdon Court
Calver Road
Winwick Quay
WARRINGTON
Cheshire
WA2 8QB
Tel: 01925 241642

Franklin Electronic Publishers
Windmill Business Village
Brooklands Close
SUNBURY-ON-THAMES
Middlesex
TW16 7DY
Tel: 01932 891025

Lucid Research Limited
PO Box 63
BEVERLEY
East Yorkshire
HU17 8ZZ
Tel/Fax: 01482 465589
http://www.lucid-research.com/
E- mail: j.k.horne@psy.ac.uk
and info@lucid-research.com

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

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.

Bookshops

http://www.takethat.co.uk/links.htm
Index page giving access to a wide range of bookshops including, for example, Amazon, Internet Bookshop (WH Smith) and Book Pl@ce.