Provision and Use of Information Technology with Dyslexic Students in University in Europe

An EU funded project

Edited by Ian Smythe

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1. Introduction, Aims and objectives of the project

Ian Smythe

The following information was provided to the European Commission as the original specification of the project. However, the project has been extended greatly beyond this.

Introduction

When it comes to Information and Communications Technology (ICT), there is a plentiful supply of assistive technology to help the dyslexic individual working in the English language. But with the exception of one or two pieces of software, there is a general shortage of ICT to help the dyslexic individual across Europe. With accessibility becoming an increasing important issue as the institution, national and EU level, there was an apparent need to find out not only what was available, but also what was required.

This EU funded project was developed as a way to identify what ICT needs to be developed and in what language, based on a clear framework of needs. In order to fulfil this aim, the project had to step back to ask fundamental questions. These included:

What is dyslexia?
How do you identify needs?
What support can be given?
What is the role of ICT?
What ICT is currently available?
What ICT needs to be developed?

To achieve these aims, the project consulted dyslexics, practitioners, policy makers and developers across Europe to bring together examples of best practice, to share ideas, and to find ways to help these individuals with respect to the diversity of awareness and technology across the partner countries.

The original partners (England, Wales, Sweden and Greece) offered a diversity of approaches and technological sophistication. Hungary (project partner from October 2002) provided additional information due to the long history of support generally available to students, as well as a long history of awareness and understanding of dyslexia (from 1916) in Hungary. During the life of the project, Hungary became a member state of the EU. The other partner to join was Romania (joined May 2003), which currently has no policies with respect to dyslexia, and is struggling to come to terms with disability policies and inclusive education, particularly with respect to their impending entry into the EU in 2007. Their relatively low level of ICT provided further insights into potential implementation of recommendations of both this project and EU accessibility guidelines.

Additional countries offered to make contributions, to highlight their own situation, and provide a basis on which to develop support within their country.

Implementation
The project involved a number of approached to fulfil its aims, with this report providing the major conclusions. Further details can be found on the website at www.welshdyslexia.info/minerva/.

Data collection included face-to-face and email discussions, led to the development of an outline questionnaire that provided the basis for the development of information. The first pilot study of the questionnaire took place in Hungary in November 2002, with the report being made available in February 2003. The results were circulated and became the basis of surveys in other countries, details of which were presented at the workshop in Edinburgh (June 2003).

The Edinburgh workshop in June 2003 provided not only a forum to present the information gathered in response to the questionnaire, but also to present and discuss the key issues that underpin the project. The project team includes a number of experts who prepared presentations on their specialist area for the team. These were subsequently rewritten and form the chapters in this book. The workshop included delegates from Bulgaria, Denmark, England, Greece, Poland, Romania, Scotland, Spain, Sweden and Wales

The first major “dissemination” exercise was at the European Dyslexia Association conference in Budapest, October 2003, where the principles of the project were presented, along with some of the information that was provided at the Edinburgh workshop.

A second workshop was held in Cardiff to discuss issues that had arisen out of the first workshop, and progress that had been made since, as well as discuss plans for the pilot project. The workshop included delegates from Austria, Canada, Denmark, Egypt, England, Greece, Romania, Russia, Scotland, Sweden and Wales

Further dissemination has been carried out through a series of workshops, seminars and conferences in England (including the British Dyslexia Association International Dyslexia Conference, Warwick, April 2004), Wales, Sweden, Hungary and Romania. The project was also presented at conferences and workshops arranged by government agencies and NGOs in USA, Brazil and Hong Kong.

Porject specificiations

Project title: Provision and Use of Information Technology with Adult Dyslexic Students in University in Europe
Reference number: 101100-CP-1-2002-1-UK-MINERVA-M
Name of Coordinator: Dr Ian Smythe
Partner countries: Hungary, Greece, Romania, Sweden, UK and Wales.
Contributors: Austria, Bulgaria, Canada, Cyprus, Denmark, Egypt, England, France, Greece, Holland, Hong Kong, Hungary, Japan, Poland, Romania, Scotland, Spain, Sweden, United States, Wales.
Internet site of project: www.welshdyslexia.info/minerva/

Objectives of project
The objectives of the project are 1) to find out what assistive technology is being used by the dyslexic individuals at university or other higher education institution, 2) to evaluate the effectiveness of assistive technology, and 3) identify what is not available in the languages under review. Furthermore, policies which allow students to fully utilise the technology and financial assistance will be scrutinised for effectiveness, comparisons, and response to EU and national legislation and directives. This report is a summary of the findings. Specific recommendations are outlined in a separate report.

Types of activities
The methods include sampling policies (e.g. government legislation, institution policies and tutor guidelines where available), interviews and questionnaires with all relevant parties. Software will also be reviewed in terms of availability and usefulness. The information and materials gathered will be evaluated by an international panel including user groups.

Target groups
The principle target group is the dyslexic individual, who constitute up to ten percent of the university population, but the project will also help those whose first language is not the language of tuition.

Evaluation/ dissemination strategies
The principal evaluation strategy involves implementation of a pilot study based on the finding of the project, verifying that the recommendations can be implemented across diverse European environments.

Internal and external reviews have been solicited from outside the project's user groups, including appropriate professionals and end users, to provide additional input, recommendations and outcomes. Their feedback will be noted, and modifications to the report made prior to final release.

Dissemination of the information will be in the form of publications, conferences and workshops aimed at decision makers in universities and

government, as well as end users, the students. Ongoing dissemination during the project will be through the dedicated web-site.

Products and outputs

The principal product is this report which provides a synopsis of findings of the study, including recommendations in terms of policy and future software development, and makes recommendations to help direct policy implementation in tertiary education across Europe.

2. About the Welsh Dyslexia Project
Michael Davies

The Welsh Dyslexia Project aims to bring together professionals working with the dyslexia community, the commercial sector, government agencies, parents and carers, as well as dyslexic individuals to create an environment where the dyslexic individual in Wales may develop to their full potential. This will be facilitated through the development of awareness and understanding, as well as resources, for the support of the dyslexic individual.

In September 2000, the Welsh Dyslexia Project made a presentation to the Welsh Assembly which included its Vision in respect to resources, schools, training and policies. Since then we have been using it as a framework for action, for developing tools and training to make a difference where it matters. Our vision was to make Wales the best place in the world for the dyslexic individual.

However, being better than others does not mean everything is being done that can be done. Our aim is to create a level playing field in the community, in school and in the working environment. By continuing to strive for improvement we shall not only ensure that every dyslexic individual in Wales is given the best opportunity to demonstrate their potential but show the world that given the right environment, everybody can succeed.

Michael Davies
Chairman Welsh Dyslexia Project

Since its formation, the Welsh Dyslexia Project/Prosiect Dyslexia Cymru has had a vision of the future, developed to provide a platform for project development. Although much of the early work was seen as implementation of government policies, it became very apparent, especially within the context of this project, that it is possible develop the resources even when policies do not exist. For example, in countries such as Romania, where there is no legislation to protect the dyslexic individual, it is still possible to develop these resources without waiting for the legislation. All students in the countries of the project have access to computers, but not all have developed the resources to assist the dyslexic individual. And before you have the resources, you need the plan to know what to develop. This is what this project is all about.

Below is the basis outline developed by the Welsh Dyslexia Project/Prosiect Dyslexia Cymru, which may be seen as a resource development guide. Rather than just focus on those relevant to university, the entire list is provided, since this may help in the formulation of resource development strategies in other countries.

The WDP recognises the need to develop three principal areas:

- Policies
- Resources
- Training

The policies, through the Welsh Code of Practice, provide well established principles. The WDP/PDC sees its role as ensuring the development of resources and training. If these are not being provided by government, service providers or others, the WDP/PDC will attempt to facilitate their development. Furthermore, special attention is paid to the responsibilities of educational establishments and employers.

The aims and objectives which form the foundation of resource and service development of the WDP/PDC as set out in their strategic plan are set out below.

Policies

- Education policies should recognise that every individual has unique characteristics, interests, abilities and learning needs, and education systems should be designed to provide informed evaluations and derive appropriate educational programmes to accommodate the wide diversity of these characteristics and needs.

- Work and life related policies, eg disability discrimination legislation, should ensure that no individual is excluded or penalised because they learn in a different way.

- All policies should reflect that these rights are irrespective of the individual's first language.

Resources

- Screening and assessment of the dyslexic individual should be freely available for all, using a well-researched, widely accepted test (or range of tests) based on current theories. These tests should be relevant to needs and support, and provide the basis for the formation of an individual education plan, including additional resource support (e.g. ICT requirements), and/or guidance for personal development.

- Teaching and learning resources (e.g. paper and computer based teaching materials) should be available to teach the dyslexic individual literacy and life skills, and help strengthen other area of weakness that may be identified.

- Support material and devices (e.g. text readers) should be widely accessible and acceptable for education and employment purposes.

- Guidance and awareness information should be widely available (e.g. web based) to the general public, and to all professionals who may be working with or supporting the dyslexic individual.

Training

- Every educational establishment should have staff trained in the identification of individuals with specific learning difficulties.

- All staff in educational establishments should be trained in the awareness and understanding of dyslexia, and how to provide accommodations within a normal teaching/learning environment.

- All those concerned with education (e.g. Governors, learning support assistant and policy makers) should know their responsibilities towards dyslexic individuals.

- All those working with or caring for the dyslexic individual, (e.g. parents, educational and occupational psychologists, speech and language therapists, disability officers, human resources personnel, community workers) should be trained to identify specific learning difficulties using the latest tools, and to provide recommendations with respect to the latest developments, including ICT.

- Every dyslexic individual should be provided training to understand, discover, explore and capitalise upon their strengths and weakness to ensure they gain the maximum benefit from support and recommendations resulting from their needs assessment.

Educational establishments and employers

- Each educational establishment should have individuals trained in the recognition of the dyslexic individual and their needs.

- All employers should be aware of the special needs and abilities of the dyslexic individual, and should ensure their abilities, strengths and weaknesses are fully utilised for the benefit of the individual, the employer and society.

- All staff should be trained in the awareness and understanding of dyslexia, and how to accommodate the individual within the normal learning and working environment.

- All schools and employers should have policy guidelines to ensure an inclusive approach is adopted for dyslexia.

- Any support provided should be seen as a fundamental human right which ensure these individuals are empowered within society, and are not perceived as an advantage to the dyslexic individual by the general public.

3. What is dyslexia? - A framework for Europe

Ian Smythe

Although this project would appear to be about the specifics of how to provide the ICT components of support to the dyslexic individual, it is important to set this within a framework of understanding of the problems, and how to support the individual in EU, national and institutional legislation and policies. Therefore, it has been necessary to review the issues, and in doing so provide not only a framework which may be used by those countries just starting out on the road to implementation, but also to revisit the foundations of those whose provision was developed on an ad hoc basis, and which may not have been updated according to our current understanding of dyslexic. Thus, the purpose of this chapter is to compare and contrast different approaches to dyslexia and place it in the context of an understanding of disabilities which may be applied to the European university environment, irrespective of the language in question.

In order to come to terms with the question "What is dyslexia?", we need to start with an understanding of definitions, and why we have them. There are many reasons, and the main ones are listed below.

Robinson (1950) says a definition is:

a search for a cause;
an attempt to determine the conditions in which something occurs;
the search for a key that will explain a mass of facts, improving one's concept, saying how a word is used.

To this Miles (1995) added:

stating its place in the context of national educational policy,
providing a guide to diagnosis,
finding a legal description that will automatically give entitlement to special help or provision.

It is important, therefore, that we have a definition of dyslexia to provide a common terminology for all, to provide a basis upon which assessment may be made, and provide the focus for provision. Without a clear definition it will be difficult to decide who should have what support. Furthermore, in terms of research, investigators will be examining different processes and outcomes using different criteria.

In most legislation across Europe, dyslexia is not covered specifically, but comes under the umbrella term of disabilities. Unfortunately, as we shall see, although the disabilities legislation may cater for the physical and sensory handicaps, as well as those with moderate or severe learning difficulties, it does not necessarily support those with specific learning difficulties.

It is important to note that some students suggest that it is not they who are disabled, but society. Although this may be a desirable, forward thinking, inclusive “social model” of dyslexia, it was felt important in this project to contextualise within existing frameworks, whilst acknowledging alternative approaches such as this. Indeed, it can be argued that in some cases dyslexia may be an advantage, since the divergent thinking of the dyslexic individual may offer an alternative approach to problem solving. In this case the term learning differences would be more suitable. However, the problem with this approach is that students would lose funding, since current legislation (e.g. in the UK) will only provide ICT support (e.g. funding for computer hardware and software) if there is a documentary evidence of a disability. That is, the assessor has to demonstrate in their report that the student is at a clear disadvantage compared to other learners, and requires additional support. If the student is simply labelled “different”, then it may be argued that everybody is different, and either everybody has the support, or nobody has it. The first option is too expensive and therefore, the label of having a disability will remain a necessity, at least for the foreseeable future.

Disabilities

The EU views a disabled person as someone with a physical or mental impairment that has a substantial and long term adverse effect on the ability to carry out normal day-to-day activities. How the disabled individual is treated usually falls into one of two categories – the “medical model” or the “social model”. The World Health Organization (WHO) writes about disabilities that are medically-based, meaning the individual is seen as limited by their impairment, that it is the individual who needs “fixing” with the aid of “rehabilitation” services, and eligibility entitlements should be based on severity. In contrast, the social model, adopted widely across Europe, suggests that the individual can be catered for within society through accommodations necessary to carry out life activities. These accommodations are about the removal of barriers in society, providing support through assistive technology and support mechanisms, with eligibility for these accommodations seen as a fundamental right, provided by mainstream services.

In considering dyslexia and disabilities, it is necessary to set these issues within the wider context of international proclamations and declarations, some of which are provided below. Note that only the components which are most closely associated with dyslexia are included.

United Nations Universal Declaration of Human Rights
On December 10, 1948 the General Assembly of the United Nations adopted and proclaimed the Universal Declaration of Human Rights
Resolution 217 Article 26

"Everyone has the right to education.
Education shall be free, at least in the elementary and fundamental stages.
Elementary education shall be compulsory."

Unfortunately, they missed the point – what should be provided is not just education, but *appropriate* education.

There are a number of statements signed jointly by countries attending world education conferences which need to be considered. It may be argued that they created the foundation of some guiding legislation in various countries.

World Conference on Education for All (Jontiem, Thailand, in 1990)
People should "be able to benefit from educational opportunities designed to meet their basic learning needs" (Article 1)

"Steps need to be taken to provide equal access to education to every category of disabled persons as an integral part of the education system" and "should be met through a variety of delivery systems." (Article 5)

"The focus of basic education must, therefore, be on actual learning acquisition and outcome, rather than exclusively upon enrolment..." (Article 4)

The World Conference on Special Needs Education (Salamanca, Spain June 1994 with representatives of 92 governments and 25 international organisations)
Signatories to the Salamanca Statement agreed that:
• every child has unique characteristics, interests, abilities and learning needs
• education systems should be designed and educational programmes implemented to take into account the wide diversity of these characteristics and needs

The Salamanca guidelines included

... a need to take full account of individual differences (Statement 21)
... adapting to the needs of the child (Statement 28)
... providing additional assistance and support to children requiring it (Statement 29)
... identifying difficulties and assist pupils to overcome them (Statement 31)
... appropriate teacher training (Statement 42)

International Convention to Promote and Protect the Rights and Dignity of Persons with Disabilities

This convention is currently under discussion and debate (2004). It has been argued that there is little point in taking part in these discussions as they have little influence. (One only has to look at human rights abuses with respect to prisoners and detention around the world, and the failure of similar UN declarations, to appreciate that there is more than a grain of truth in this.) However, the following modifications were suggested (in bold) which would have made it more consistent with the needs of the dyslexia community.

Article 13
States Parties shall adopt all measures necessary to eliminate discrimination against persons with disabilities and ensure - in conditions of equality of opportunity - their inclusion, continuance, and participation in formal education activities at all levels: For this purpose, States Party must:
a) Include education for persons with disabilities in national teaching plans, in the preparation of study programs, and in scholastic organization so as to guarantee their access to the formal education system.
b) Guarantee **appropriate** public education free of charge at all levels and types for persons with disabilities.
c) Promote the creation, production, and distribution of educational materials and technical support tailored to the education needs of persons with disabilities.
d) Promote regulations to ensure that the design of school buildings includes the infrastructure necessary to meet the specific needs of persons with disabilities.
e) Create, design, and perfect special teaching and evaluation systems tailored to the specific needs of persons with disabilities, to be included in formal education programs.
f) Establish permanent training and updating for teachers and other professionals involved in the education of persons with disabilities.
g) Conduct consultations with disabled peoples' organizations to effect adaptations in education plans and programs.
h) Recognise that every individual has unique characteristics, interests, abilities and learning needs, and education systems should be designed to provide informed evaluations and derive appropriate educational programmes to accommodate the wide diversity of these characteristics and needs.

Special note should also be given to this applying not just to primary and secondary education, but also to lifelong learning.

Models of disability

There are two major models of disability, the medical model and the social model. Further "models" exist, but the dominant one in Europe with respect to disabilities is the social model. The differences are outlines in the table below.

	Medical model	**Social model**
Definition of Disability	An individual is limited by his/her impairment or condition	An impairment that requires an accommodation to perform functions required to carry out life activities.
Strategy to Address Disability	Fix the individual, correct the deficit	Remove barriers, ensure access through accommodation and universal design.
Method to Address Disability	Provision of medical, vocational, or psychological rehabilitation services	Provision of supports, e.g., ICT, job coach, specialist teaching.
Source of Intervention	Professionals, clinicians, and other rehabilitation service providers	Mainstream service providers, with training in delivery of specific needs.
Entitlements	Eligibility for benefits based on severity of impairment	Eligibility for accommodations seen as civil right

In reality, appropriate support does not fit neatly into either category, and many practitioners would argue that it is inappropriate to try to push dyslexia provision into one compartment of the other. The above is a theoretical framework designed to provide a basis for discussion.

Most of the current support in the field of dyslexia in Europe may be seen as trying to fit the "social" model and people will argue that it is the social model that should be pursued. However, there are problems with this model, and the desire to fulfil specific goals based on a theoretical model may be highlighted when you consider university specialists dedicated to supporting the dyslexic individual. Using the above model, these would appear to come under the "medical" model, since they are disability specific specialists. It may be argued that it would be better to train mainstream service providers to cater for all, which would reflect a "social" model. This would ensure greater support across the spectrum, but would mean the withdrawal of the specialist support. Furthermore, universal design, that is designs that may be used by all, is a goal, but should not be seen as the only possibility. Due consideration should be given to the compromises that are forced through current technological considerations. What should done is provide access to content through alternative means, rather than have what amounts to a "one size suits all" approach.

A thought should also be given to those who are supplying materials to be used by the dyslexic individual. Currently many universities give considerable support to those with literacy difficulties based on the problems of obtaining knowledge and information from the written word. In the dyslexia world, there is an emphasis on lecturers making presentations more visually stimulating. However, much support is given to those lecturers who, when it comes to "visual literacy", may be considered disabled? If we are to consider the difficulties of those customarily receiving knowledge in the written format, should we not also provide support to those lecturers and tutors who are being asked to present in a format that is not their preferred format?

EU Policies and Resolutions

There have been many resolutions passed by the EU aimed at supporting the disability community. This particular example refers to the need to take on board issues with respect to students, including those at university. Note the explicit inclusion of technology related issues.

Council Resolution - of 5 May 2003 on equal opportunities for pupils and students with disabilities in education and training (2003/C 134/04)

… invites member states and the commission, within their respective competencies, to:

(i) encourage and support the full integration of children and young people with special needs in society through their appropriate education and training, and their insertion in a school system which is [. . .] adapted to their needs;

(ii) pursue efforts to make lifelong learning more accessible to people with disabilities and, within this context, give particular attention to the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration (*e*-learning);

(iii) encourage the accessibility of all public websites covering guidance, education and vocational training [. . .] to persons with disabilities by respecting the web accessibilities guidelines;

(iv) increase, where appropriate, adequate support of services and technical assistance to pupils and students with special education and training needs;

(v) facilitate further proper information and guidance in order to allow disabled people themselves or, if necessary, their parents or other responsible persons involved in choosing the appropriate type of education;

(vi) continue and, if necessary, increase the efforts aiming at the initial and in-service training of teachers in the area of special needs, with a view, in particular, to the provision of appropriate pedagogical techniques and materials;

(vii) promote European cooperation between the relevant actors professionally involved in the education and training of children and young people with disabilities, in order to improve the integration of pupils and students with special needs in ordinary or specialised establishments;

(viii) enhance sharing information and experiences on these matters at European level, involving, as appropriate, the European organisations and networks with relevant experience in this field such as the European Agency for Development in Special Needs Education;

(ix) provide, where appropriate, facilities, training opportunities and resources regarding the transition from school to employment.

Unfortunately there is no funding or guidance as to how that should be achieved, nor an evaluation system to ensure it has been carried out. Furthermore, at an EU meeting in Brussels to discuss the need for more ICT guidelines, presentation by EU nominees failed to be accessible demonstrating that the difficulty is implementation, not a lack of guidelines.

UK Disability Discrimination Act

Many countries have legislation which is intended to limit discrimination in the work place, and at educational establishments. The following are taken from the UK Disability Discrimination Act (DDA), and similar sections can be found in disability legislation across Europe.

“A person has a disability if he has a physical or mental impairment which has a substantial and long-term adverse effect on his ability to carry out normal day-to-day activities.”

The DDA defines discrimination in two ways. Discrimination occurs when someone is refused or deliberately not provided with service; provided with a lower standard of service; or service in a poorer manner; or provided with service on poorer terms; than other people are treated, and this treatment cannot be justified. It also occurs when a service provider fails, without justification, to make a reasonable adjustment.

In most cases it is clear when somebody is disabled, though usually the legislation requires guidelines on implementation, and court cases, to define for example, what constitutes just how long “long-term adverse effect” has to last in order for it to be a disability.

Contextual disabilities

There are times when a dyslexic individual may not be considered disabled. This would be when the dyslexia is judged not to impact on their day-to-day activities. For example, consider two individual who are equally dyslexic, one is an office manager and the other is a lumberjack. It may be argued that the office manager has to do lots of reading, and therefore should be considered disabled. However, in cutting down trees you do not need literacy skills, so although dyslexic, the lumberjack is not considered disabled.

So the irony is that the lumberjack may have that job because the system in which he was disabled, the education system, failed to recognise and support him. Now as a lumberjack they may acknowledge the dyslexia, but do not classify him as disabled since he does not need literacy skills, a job he ended up with due to his disability during school years. However, if he wanted to increase his promotion prospects, he may attempt to improve his skills by taking literacy classes, which may lead to an assessment and classification of being disabled.

However, this argument still concentrates on the literacy components in a learning environment, and ignores the disabling aspect of not being able to read contents on packing in shops, not being able to interpret timetables, and not understanding information sent through the post, such as tax demands or suspension of services for failing to respond to a previous letter. For many dyslexics, these issues are as significant in their day-to-day lives as a staricase can be for a wheelchair user.

Concepts

Before we define “the concept of dyslexia”, it is important to understand what is meant by the word “concept”. In classical terms, everything that conforms to the same criteria may be considered to belong to that class or concept.

Consider the concept of "square". Everything that is a square must have four sides, each side must be equal, each angle must be 90 degrees, and it must be closed. In the classical view of concepts, everything belonging to that group must have the same characteristics. Otherwise it does not belong to that group. However, consider board games, card games, team ball games or children’s playground games; these are all considered games. These are all very different so it is difficult to specify the concept of a game. What are the criteria?

Historically, much of the work on dyslexia has been approached from a “classical concept” perspective. That is, there has been an assumption that there must be a core deficit that is common to all dyslexic individuals. Wittgenstein, the Austrian philosopher, suggested that it was possible to have

a concept where there were no defining characteristics, but that there were "family resemblances". We hope to show that the approach of Wittgenstein, which would see concepts as a “network of overlapping and criss-crossing similarities may be more appropriate for dyslexia.

Definitions users

Now consider who can write a definition. The answer is that anybody can write a definition. What is important is who accepts that definition. Stanovich (1992) noted that definitions of dyslexia may serve many different groups, and each will have their own definition. These groups include:

1) researchers who needs to construct good research, and provide a consensus on cause, effects, consequences, remediation etc.
2) education personnel (including teachers and educational psychologists) whereby additional services may be provided for low achievers.
3) parent groups who will use a definition that will help ensure their children will be allocated appropriate resources (human and financial).
4) dyslexic individuals who, among other things, wants to have a label to help understand their difficulties.

Each interest group - researchers, teachers, educational psychologists, politicians, employers, parents and dyslexic individuals - has a reason why they should be interested in dyslexia, and their requirements of a definition may vary. Of these, the most powerful may be considered the school personnel, as it is usually they who decide who gets help. Therefore, it may be argued that their definition is the most important since it has far reaching implications. However, like all definitions, it should be based on good research, and take account of the role of the parents, as well as aspects that may not be directly relevant to the classroom environment.

While discussing the defining "authority", let us also consider how that is turned into practice. To decide who is given support, one must determine criteria which have to be met. No matter what research may show, it is likely to be the criteria of the funder that will determine if support is provided. Unfortunately around the world many funders still use inappropriate criteria to decide who gets help. One example is the continued need to provide an intelligence test score (IQ), even though research clearly demonstrates that this is irrelevant. This will be discussed later in more detail.

Dyslexia

Literally ‘dyslexia’ means difficulty (dys) with words (lexis), thus implying concepts beyond reading, and is derived from Greek. It may be argued that what has happened in this field is that the term came first, based on a Greek that is more general than intended, and people are still trying to decide what the word means.

Turning to the question of “What is dyslexia?” there are many ways to define this. There are several approaches which we shall analyses to see if they can be improved or modified to provide a more useful definition. We shall look at various definitions including those of the British Psychological Society, the British Dyslexia Association and the International Dyslexia Association.

However, before we discuss the definition, let us ask if the idea of dyslexia is logical. Does it make sense at the neurological level to think that somebody could only have problems with literacy when other functions appear to work perfectly well? We know that people come in all shapes and sizes, and there are average height people, and short people and tall people. And we know that some tall people have little hands, and some small people have big hands. Just because you know their height does not mean that you know their glove size. We do not need researchers to tell us this. Similarly, just because you know the glove size does not mean you know the shoe size. That is, you cannot assume you know about one part of the body just because you have measured another part. So is it so hard to believe that just because we know one part of the brain works in a particular way, it does not mean we know how other parts will work? This is part of what makes everybody unique. However, as we shall see, literacy requires a large number of different skills in order to develop well. Shortcomings in some areas can be overcome by abilities in other areas. However, it is important to remember that those skills are not used only for literacy. Deficits in cognitive skills important in reading, such as short term memory, can cause problems in many different activities. Therefore it would be wrong to suggest that a dyslexic individual will demonstrate difficulties “only” in literacy skills. In reality, the dyslexic individual has many difficulties over and above those of reading and writing, and these are a direct consequence of the cognitive difficulties that affect their literacy development.

Brain scans have confirmed that people’s brains are’ wired’ differently, and these small differences can lead to differences in the ability to acquire reading and writing skills. The differences may have a number of causes, of which a genetic component appears to be very common. This has been shown in studies of twins. It has been suggested that there may be a greater incidence of dyslexia amongst boys, but recent evidence suggests that this is due to methodological errors, rather than a true difference.

There are two main types of definition to consider – symptom and causal. A symptom based definition states the effect of the problem, while the causal based definition suggests the causes of those symptoms.

So now let us consider a proposed definition which includes some "universal" components from recent definitions including the Netherlands Health Council, the British Psychological Society, and the International Dyslexia Association (IDA).

The following is a combination of the definitions provided by those listed above:
"Dyslexia is a difficulty in the acquisition of literacy skills that is neurological in origin. It is evident when accurate and fluent word reading, spelling and writing develops very incompletely or with great difficulty."

There are a number of key components in this. "Neurological" means that it is internal to the individual, and not an external factor such as poor teaching or lack of schooling.

Fluency and accuracy may be considered "universal" measures of literacy ability. Note that in a language where there is a good correspondence between the way a word is spelt and the way it is said, a dyslexic can be very accurate, but lack fluency in their reading.

Since this is suggesting the symptoms of dyslexia, this part may be seen as a symptom based definition.

However, some people prefer to use definitions that include a causal component, and shortly we shall look at our proposed definition which includes a causal component. When including a causal component, it is important to understand why it is there, and its potential impact. For example, the IDA definition states "These difficulties typically result from a deficit in the phonological component ..." What about all those dyslexics who do not have a phonological deficit? There is no apparent logic including a statistical probability component in a definition.

So now let us consider what could be the cause of dyslexia. Reading and writing are complicated and involve many processes in different parts of the brain. There are speech based components, including the perception and recall of sounds, as well as their manipulation which have been shown to be important in dyslexia.

Similarly there are visual components, including visual perception and visual memory, which may be more important in some languages such as Chinese. However, they are very important in English spelling as you cannot always use rules to predict how words should be spelled. English has many irregular words for example, have, pear, said. Working memory, that is the ability to process and manipulate information, has been shown to be very important, especially in languages where there is unpredictable sound-to-letter correspondence.

We also have “lexical storage and retrieval” which refers to the access to the written, spoken and meaning based stores of information. These may be referred to as the orthographic lexicon, the phonological lexicon and the

semantic lexicon. Our brains store information as whole or parts orthographic, phonological or semantic components used in the literacy process.

The role of motor skills and in particular handwriting should not be ignored. Many practitioners believe that spelling may be improved if cursive (or joined up) writing is used, since if letters are joined together in words, we have a better chance of remembering the combination due to the motor patterns developed. This is similar to how many people find that spelling becomes automatic when typing, and you know which key to press without thinking about the spelling. This suggests that we have a "motor map" for words, in typing and in handwriting.

Thus we can have the following as the causal component:

> *"It may be caused by a combination of difficulties in auditory and visual processing, working memory, storage and retrieval in the lexicon (word banks) and motor difficulties."*

This reflects the parts discussed earlier. Furthermore, it provides a basis for understanding the various identifiers commonly found in checklists for dyslexia, as well as providing a basis for developing an assessment protocol.

Some definitions say that dyslexia "... can cause unexpected and persistent difficulties in acquiring ... reading, writing, spelling and sometimes numeracy and spoken language." This suggests that dyslexia is not the difficulty but causes the difficulty. Therefore dyslexia is a neurological difference. This would be acceptable if it was possible to trace the cause of dyslexia to a single neurological difference. Consider the difference between "A broken arm is constitutional in origin and can cause difficulties in writing, throwing etc" and "A broken arm is when one or more bones in an arm are broken." The difference is that one is a symptom definition and the other is a causal definition. Symptoms will tell you what areas it affects. Specifying potential causes in the definition helps target diagnostic criteria.

Terminology

However, if we look more widely, we can see the term dyslexia used in different ways. For example in Russia the term dyslexia is restricted to reading, while dysgraphia is used for writing. In Italy the term dysgraphia is used for motor difficulties, and dysorthographia is used for spelling difficulties. But in Poland, dysgraphia is a motor difficulty, and dysautographia for handwriting difficulties.

In the UK many people use the term “specific learning difficulties” or SpLD. Dyslexia used to be considered as the same as SpLD, but now it is generally acknowledged that dyslexia is one of several specific learning difficulties which may include dyscalculia, a maths difficulty, and dyspraxia, a motor difficulty. The term frequently used in the USA is “learning disabilities”. This should be considered an umbrella term similar to SpLD.

Some have argued that Attention Deficit (Hyperactivity) Disorder should also be included. However, this is a behavioural rather than a learning difficulty. Further confusion arises because the terms dyslexia and SpLD are used in close proximity, and are linked historically. For example the British Dyslexia Association is still noted on a number of websites as “the national organisation for specific learning difficulties” (e.g. The Literacy Trust - www.literacytrust.org.uk), and its own website uses phrases such as “This has been found to be essential for those with specific learning difficulties/dyslexia.” without making it clear what is meant by this.

The problem becomes more complex when we consider when more than one specific learning difficulty exists, as is frequently the case. These specific learning difficulties have underlying cognitive processing difficulties, and these may be an underlying cause of more than one SpLD. Consequently, there is considerable overlap, and consequently many dyslexics also have some degree of dyspraxia as well as other difficulties.

Therefore, in an international context we have to be careful how we use these terms. Indeed, it may be argued that it is best to describe the difficulties, and not use a label, particularly when it does not provide additional support.

Incidence

Each of these difficulties occurs along a continuum. It is not a case of either you are dyslexic or not. The degree of cognitive difficulty will determine how much difficulty you have, or how dyslexic you are. For this reason, any categorical statement of prevalence must be dependent upon the criteria set out. For example, if you want to say that anybody is, say, two standard deviations from the mean, this means that 2.39% of the population will fall into this category. If you have less stringent criteria, then you will have more individuals identified. A criterion of one standard deviation will mean about 17% of the population.

Difficulties in different languages

Before we leave this section, let us ask the question if dyslexia is the same in all languages. The answer is no; dyslexics using in different languages may have different underlying causes of their difficulties. It is widely reported that the phonological manipulation skill deficit is the biggest problem in English, where there is poor letter-to-sound correspondence. In Hungarian, where there is good letter-sound correspondence, it is auditory processing that is more predictive of difficulties. This is also the important in Chinese, though visual skills can also be an issue in many individuals.

To give a more concrete example, consider the Hungarian language, for which teaching resources for dyslexics have been available since 1916. The Hungarian language is very regular, with an almost perfect letter to sound

correspondence. But try reading or spelling “accurately and fluency” the Hungarian word for “at risk of dyslexia” – diszlexiaveszélyeztetettség. Phonological skills such as rhyming are not an issue since they do not need to use this component for analogy. However, sound discrimination, segmentation and auditory memory are very important.

For this reason, we need to add that "the manifestation of dyslexia in any individual will depend not only upon individual cognitive differences, but also the language used." Note that the stress here is the outcome of the assessment of the individual. As previously discussed, how dyslexics as a group respond will, at best, provide some indication as to probable causes. It does not tell us the specific difficulties of any individual, which can only be identified by the use of appropriate assessment.

The proposed definition

The definition, proposed for a wider audience, is therefore:

> *Dyslexia is a difficulty in the acquisition of literacy skills that is neurological in origin. It is evident when accurate and fluent word reading, spelling and writing develops very incompletely. It may be caused by a combination of difficulties in auditory and visual processing, working memory, storage and retrieval in the lexicon (word banks) and motor difficulties. The manifestation of dyslexia in any individual will depend upon not only individual cognitive differences, but also the language used.*

A single generally agreed definition could provide the unity this field has been seeking for many years. As Karl Popper would argue, this should be considered a hypothesis that is capable of being disproved. In considering its merits, it should be noted that this definition provides an understanding of many issues, including an understanding of how items in a checklist may be related to the difficulties associated with dyslexia, even though they may not be obviously related to reading and writing. This will be demonstrated in later sections.

Differential dyslexia

Surprising as it may seem, it is possible to be dyslexic in one language and not a second language. But of course it is not that simple.

A number of researchers have found that some bilingual individuals learn at different rates. For example, in Canada some children were found to have “dyslexia difficulties” in English but not Chinese, while others had “dyslexia difficulties” with Chinese but not English. Furthermore, differential dyslexics

have been found who could read English from left to right, but had trouble with Hebrew, reading from right to left, as well as a bilingual who had no trouble in Japanese but was “dyslexic in English”. Finally, a research project found who were able to learn to read and write in English much better relatively than Swedish, even though Swedish, a reasonably transparent language, was their first language.

This research, as well as highlighting the possibility of “differential dyslexia”, challenges the notion that if a dyslexic individual has difficulties in their first language, they will have difficulties in their second language. This is understandable when it is acknowledged that different languages have different cognitive demands.

But of course dyslexia is more than just about reading and writing. For example, if you have trouble getting your thoughts down on paper in one language, you will also have trouble in a second language. And if you have a short term memory problem, then it remains no matter what language.

This issue becomes particularly important when attempting to investigate the history of some multilingual students, and why they may be appearing to be dyslexic now, but were not previously diagnosed. Thus the language demands may also mean that their specific cognitive difficulty was not apparently impacting in their first language, but is now making it difficult to acquire literacy skills in English.

4. Assessment of the dyslexic adult: A framework for Europe
Ian Smythe and Linda Siegel

Assessment of the dyslexia adult
By Ian Smythe and Linda Siegel

The purpose of this chapter is to propose a common European framework for the assessment of the dyslexic individual. It is based on sound research and practice, from many countries, and provides not only a theoretical basis but also a way to move forward for those countries which currently do not have such protocols or tests. It also will allow others to compare their existing protocols to an alternative approach. It is written without reference to specific tests, and should be considered with respect not only to the educational environment but also the language, script and cultural context. This should not be seen as a definitive framework, but one that may form the starting point of future work and discussions.

Although developed with respect to identification of the dyslexic adult, many of the comments are generic, and the principles generally apply to the identification of the dyslexic child. Identification of the dyslexic child is often considered easier since there has been less opportunity to develop strategies to overcome or hide the difficulties. Therefore it may be argued that a greater understanding of the issues is required to appropriately interpret the assessment results. As discussed elsewhere in this book, it should not be assumed that a qualification to assess a dyslexic child is sufficient to also assess a dyslexic adult. Understanding and empathy developed through experience can often play at least as an important part is the assessment of the dyslexic adult as an understanding of the cognitive profile.

Dyslexia as a concept
As discussed by Wittgenstein, for an item to belong to a concept (or group), it must satisfy the criteria of the concept, either through the classic approach of total conformity, or through an association by a network of family resemblances.

In order to decide if an individual belongs to a specific group, it is necessary to demonstrate that they fulfil the criteria of that group. Since it is the definition which provides the criteria to belong to the group, then it follows that to belong to the group, an assessment must clearly demonstrate that the individual satisfies the criteria as set out in the definition. This is true irrespective of the concept, no matter where it is “tall”, “obese” or “dyslexic”.

However, the problems arise when operationising the concept and its framework. Thus you can provide a tape measure to measure how tall somebody is, but unless you decide what is the criteria, it is impossible to

determine who is tall and who is not. From a practical perspective, it is easy to say somebody is tall is their height is considerably above average. For example, if the average height of a man is 1.72 metres and a basketball player is 2.1 metres, most would agree that he is tall. But what if he is 1.89 m (10% above average) – is he still tall?

This assessment protocol under discussion here is with respect to the identification of the issues surrounding literacy difficulties. This chapter will not be concerned with the implementation of a support strategy. Therefore it will not include, for example, the assessment of the ICT necessary to support the dyslexic individual. This will be covered elsewhere.

Why assess?

There may be a number of reasons why an assessment is being carried out. There include:

- To understand the obstacles to learning
- To evaluate strengths and weakness in order to develop the IEP
- To develop better ways of teaching and learning
- To categorise for provision of support
- For self-understanding

In turn, these may be classified as: 1) for categorisation, and 2) for developing support. Although the categorisation is frequently for development of support, there are fundamental differences between the two which are important to highlight. Categorisation means to say whether or not the individual is dyslexic. The label does not inform the support process. However, there are a number of occasions when the process demands a categorical statement that the individual is dyslexic. In these instances, the operationalisation must include not only the measure but also specific criteria.

Frequently these criteria are unstated, which is understandable given the multidimentional nature of the problem to be assessed. However, it may be argued that the criteria are by consensus, having been delegated to professional groups whose opinion are considered adequate by those demanding the categorisation. Thus if the funding body, for example, for provision of ICT to dyslexics decides that those belonging to the national speech and language therapists organisation and the national psychologists association are both considered qualified to provide an assessment, not only will there be differences in the approaches and criteria used by the two professional bodies, but even within professions there will be considerable variation as to what constitutes dyslexia. This is because the assessment tools may be specified in the guidelines, but the criteria are never written down.

What is often more appropriate is to identify strengths and weaknesses, and the necessary support, based upon a framework which is developed with respect to the dyslexic individual. In many countries across Europe the label

does not help. However, if there is a clear understanding of the issues, and how best to provide support, then the assessment should be based on those aspects, and be related to the support that can be provided.

Note that this chapter attempts to provide a framework for understanding of the issues, and is relevant to both the researcher and practitioner. However, some would argue that since many of the tests cannot inform the IEP, they are irrelevant. The purpose of this chapter is to provide a full framework for understanding, and it is for the practitioner or researcher to select the items which they consider most appropriate for their given context.

Definition

As previously discussed, there are a number of alternative definitions, and each authority will decide their own definition. For the purposes of this chapter, the following will be used:

Dyslexia is a difficulty in the acquisition of literacy skills that is neurological in origin. It is evident when accurate and fluent reading, spelling and writing develops very incompletely. It may be caused by a combination of difficulties in auditory and visual processing, working memory, storage and retrieval in the lexica (word banks) and motor difficulties. The manifestation of dyslexia in any individual will depend upon not only individual cognitive differences, but also the language used.

This definition is used to illustrate how the assessment should be based on the definition, but the principles will hold true to any other definition.

Whatever definition is adopted (see previous chapter), that definition is what will provide the criteria. If you cannot demonstrate that the individual has the problems as set out in the criteria, then you cannot classify that person as having the problem.

If the definition is restricted to “fluency and accuracy” (e.g. the BPS definition) then those are the only things that need to be demonstrated. If, as above, the causal components are included, then it is necessary to demonstrate that it is the causal components that create the difficulties and not other factors.

Now let us look at the operationalisation of the definition. To do this, we need to deconstruct the definition. Note that tests rarely measure one area, and one area cannot be measured using any single test. For convenience, tests are generally noted in only one area below, but may also be thought of as belonging to other areas.

“Dyslexia is a difficulty” – note that some argue that dyslexia should be consider a difference and not a difficulty. However, the assessment for the purposes of provision (financial, human, ICT etc) there is a need to clearly

demonstrate a difficulty that is not present in other individuals. That is, it is a disability, since the provision is made within the social disability model. To suggest that it is not a disability would be to suggest the individual is not disadvantaged by their "difference". If there is no disadvantage, then there should be no additional support over and above what others receive.

"in the acquisition" – most analyses and assessments ignore this component. Indeed, there are few tests which could demonstrate the acquisitional components, despite Vygotsky (1976) and later Weschler (1972) highlighting the issues many years ago. That is, most test can only measure what can be done on the day of testing. One of the problems frequently noticed in the dyslexic is daily variation of ability and this part is therefore particularly important with this group. Furthermore, by definition, "acquisition" implicitly suggests a time component. However, few assessors do more than test at one moment in time. Instead they make assumptions about the environment and what preceded the testing time. This can be a dangerous strategy, particularly with the multilingual individual. A task recently developed by Smythe and Siegel attempts to address these issues by providing a series of multi-syllabic non-words which the individual has to read over several trials. Initial trials suggest that the dyslexic individuals have greater difficulty in speeding up as they are unable to quickly acquire the information necessary to do the task faster in this given context.

"of literacy skills" – It is important to remember that what is under investigation is "literacy skills", and the assessment should reflect this. This does not mean that, for example, numeracy skills cannot be measured. They should be if they are important in the working/learning environment for which the assessment is being performed. But they are not part of dyslexia.

"that is neurological in origin"- this is implicit in cognitive processing since cognitive processing is a consequence of the arrangement of cells and pathways at the neurological level. Even a brain scan cannot (currently) "prove" dyslexia since it is hard to confirm exactly what process is carried out where due to individual differences. Even if it demonstrates different areas are used for processing, a single scan cannot eliminate other causes, including the influence of different teaching methodologies. This should be considered a statement in the definition which need not play a part in development of the assessment protocol.

"It is evident when accurate and fluent" - Fluency and accuracy may now be considered the cornerstones of recent definitions, and need to be measured in many of the test items. However, their importance will vary from language to language. Thus for example, in Hungarian, a highly transparent language, most dyslexics will be able to read all words accurately (as most develop a simple letter-sound correspondence capability), but will do so slowly and hesitantly. Similarly the dyslexic older student may show accuracy, but not

fluency. Note that fluency should be considered as more than just speed. Although the convention is to provide timings for tests which suggest what is the norm, frequently it is the lack of a rhythm in the response that denotes the difficulty. That is, a dyslexic individual may respond quick for some items but hesitate over others. This hesitancy is hidden in an overall average response time. This effect can often be noted not only in attainment tests such as reading, but also cognitive measures such as rapid naming tasks where there are limited responses, and therefore access rather than prior knowledge is the issue.

"reading, spelling and writing" – This is open to interpretation as to what should or should not be covered by these terms. The suggestion here is that not only single word reading is important, but also continuous reading. For example, some individuals may carry out internal rehearsal for reading single words, and mask the difficulties which would be revealed when reading continuous text. Furthermore, there is the question of comprehension, and what constitutes "writing". It is recommended that some form of free writing is carried out. Although usually there is little time in the assessment context, this may provide some useful indicators of what is required. However it is important to reflect the usual working environment. That is, if the individual normally plans their work using hand drawn concept maps, one would have to question an assessment which implicitly did not allow them. Furthermore, if they have been writing exclusively on a computer for many years and are suddenly asked to write by hand, the analysis may not be valid. When evaluating their essay organisational skills, the evaluation may be compromised by changing the normal working method. Although free writing cannot be compared to "standards" or "norms", they can be analysed for patterns of errors, and the approach taken to the assignment. A skilled assessor can understand many of the difficulties of the individual when interpreting writing skills over and above handwriting, spelling and grammar issues, even though some skills, such as organisation and structure, are hard to quantify. Note that tests such as non-word reading would frequently be discussed in this section, they have been included in the lexica sections for reasons that will become apparent.

Examples of tasks for attainment

- Reading
  - Reading – single word
  - Reading - non-words
  - Reading continuous text
  - Nonsense reading passage
- Spelling
  - Spelling words
  - Spelling non-words
- Comprehension
  - Reading comprehension

"develops very incompletely" – There is a question as to what "very incompletely" means since it demands criteria. The assumption is that this is in comparison to the rest of the population.

"It may be caused" – this reflects that we cannot be sure that the dyslexia can necessarily be explain only by these factors. Karl Popper (1976) suggested that any scientific endeavour, in order to call itself scientific, should have at the heart of the work a testable hypothesis. That is, the hypothesis should be clearly set out in a manner whereby it may be disproven. Advances in scientific research occur through the process of scientific reductionism whereby each level of analysis may be mapped at a successively more basic level (Churchland, 1979), each of which itself can be conceived within the Popper principles of scientific rigour. The field of dyslexia finds itself at one-and-the-same time both within the realms of scientific research, and ignoring its very principles, eg failing to provide a consensus on the definition of dyslexia, and using a diversity of selection criteria in research. It may be argued that this definition may be considered a hypothesis.

"by a combination" – this highlights the need for a diverse battery of tests, and not make assumptions about the specific causes in any given individual.

"of difficulties in auditory" – Although the single term "auditory" is used here, it is important to remember that this has a number of components, and as many as practical in the time should be measured. High amongst that list should be measures of auditory short term memory (e.g. digit span) and auditory perception (sound discrimination). Consideration may be given to non-auditory tasks (e.g. rhythm tapping) as well as auditory tasks (word and non-word repetition)

Examples of tasks for auditory processing:

Digit span
Tapping
Sound discrimination

"and visual processing" – as with auditory processing, a number of tests should be used to cover the major areas of concern. Attempts should be made to separate components such as visual short term memory from visual perception. This may be performed by a careful selection of tests. For example a copy task where the item is removed after a limited time may be compared to one where it is always present. The difference should be a reflection of visual short term memory. Frequently visual skills are used as a basis for highlighting strengths of the individual. However, whilst it is important to highlight strengths as well as weaknesses, it is also important to remember that just because an individual has weak literacy skills, it does not mean they have strong visual skills.

Examples of tasks for visual processing:

Shape from memory
Copying tasks
Block design
Missing parts

"working memory" – There is a difference between working memory and other forms of memory. This may be considered to be the ability to hold and manipulate information. Most of the testing in this area is with respect to assessing the manipulation of auditory memory. This is a reflection of the ease of test construction in this area. However, there is no reason why measure of visual working memory could not be developed and used. As previously stated, any one test calls upon several cognitive processes. While processes of phonological manipulation may draw heavily upon the phonological storage and retrieval, certain phonological manipulation tasks will require good working memory to ensure good results. At the more comp[licated end there is "spoonerisms" whereby the first syllable on the first word and the first syllable of the second word swap places. An example would be "*real cat – keel rat*" (note that this task is a phonological not orthographic task). However, even tasks such as phoneme deletion and substitution also require good working memory in addition to lexical storage and retrieval.

Examples of tasks for working memory

Reverse digit span
Counting backwards
Spoonerisms

"storage and retrieval in the lexica (word banks)" – There are a total of four lexica which storage engrams important to literacy development. There are the orthographic, phonological, semantic and motor lexica. However, for ease of discussion, the motor lexicon is discussed separately. It may be seen that to measure the content of these lexica is to measure an attainment level. However, it is important to at least consider the attempt to measure the content of the lexicon, the test will include several components. Thus when information is provided, it has to be transferred and held. The ability to retrieve information will depend upon whether the item was ever in the lexicon, the degree to which it can be differentiated from its neighbours in the lexicon, and the ability to articulate or reproduce the contents. Rapid naming takes several forms of which one of the most common requires the individual to names four or five well known items repeated in random order. The question therefore is clearly not about whether the item exists in the specific lexicon. However, it is not clear exactly what it dos measure.

Examples of tasks to measure storage and retrieval in the lexica

- Rapid naming – picture (PhAB)
- Rapid naming – number (IDT)
- Phonological
  - Alliteration (PhAB)
  - Rhyme (PhAB)
  - Phoneme segmentation (DST)
- Orthographic
  - Orthographic choice
  - Letter-sound correspondence
- Semantic
  - Vocabulary test
  - Verbal fluency
  - Semantic fluency

"and motor difficulties" – Given the ability to develop good motor engrams would contribute notionally to good handwriting and even good spelling (handwritten and keyboard based) these should be considered. However, these skills are not so indicative of the underlying difficulties in the adult as in the child due to he development of compensation strategies.

Examples of tasks to measure motor skills

- Copying task
- Handwriting quality
- Motor coordination task

"The manifestation of dyslexia in any individual will depend upon not only individual cognitive differences, but also the language used." – This part encapsulates the need to take due account of the language of testing. However, it is important to appreciate that the difficulties of the individual are not the same as the difficulties of the group. That is, even though research clearly demonstrates that many English dyslexic individuals have difficulties with phonological manipulation, and at the group level phonological manipulation skill ability will differentiate the dyslexics from the non-dyslexics, it does not mean that the assessment of an English individual with literacy difficulties should concentrate on phonological manipulation skills. Furthermore the sound discrimination tasks for English should be relative to the English phoneme set, and when testing in Swedish, one should consider the Swedish phoneme set. When testing the multilingual individual, the phoneme set of the language of learning and the first (or preferred) language.

The use of checklists

Checklist should be treated with caution at all times, and especially with the multilingual individual. However, they can still be very useful for teachers as a screening device for dyslexia if the context is remembered. They may also provide a talking point to discuss with parents the management and remediation of the literacy and life skill difficulties that may be encountered. A typical, though not exhaustive, checklist is given below.

Checklist for the identification of dyslexia in adults

The following is a checklist developed by Dr Ian Smythe in collaboration with Dr John Everatt. It has been found to be predictive in not only English but also several other languages, including Romanian (see the chapter later in this book). The questions were based on research, with each individual having an independent evaluation some time in the past by an educational psychologist. Therefore it may be said that the results have been validated by a consensual agreement of what is dyslexia as specified by those educational psychologist. The use of it in other languages becomes possible since most of the questions are not language specific. Therefore if they are true in one language, they should be true in another. Obviously there may be cultural difference to responses. However, given that many countries do not have methods to validate since there are no standardised tests, the use of this checklist seems to offer a starting point in attempting to identify those who may require additional support. Note that the following may be used and translated by anybody. However, please acknowledge the authors, and provide additional notes, such as the fact that the results state “consistent with” and that this only a screening and not an assessment.

The questionnaire

Please answer every question. If in doubt indicate the answer that you feel is true most often. Beside each response is a number, representing the number of points for each response. At the end, add up your score and compare to the score below.

1. Do you confuse visually similar words such as cat and cot?
    - ☐ Rarely (3)
    - ☐ Occasionally (6)
    - ☐ Often (9)
    - ☐ Most of the time (12)

2. Do you lose your place or miss out lines when reading?
    - ☐ Rarely (2)
    - ☐ Occasionally (4)
    - ☐ Often (6)
    - ☐ Most of the time (8)

3. Do you confuse the names of objects, for example table for chair?
    - ☐ Rarely (1)
    - ☐ Occasionally (2)
    - ☐ Often (3)
    - ☐ Most of the time (4)

4. Do you have trouble telling left from right?
    - ☐ Rarely (1)
    - ☐ Occasionally (2)
    - ☐ Often (3)
    - ☐ Most of the time (4)

5. Is map reading or finding your way to a strange place confusing?
    - ☐ Rarely (1)
    - ☐ Occasionally (2)
    - ☐ Often (3)
    - ☐ Most of the time (4)

6. Do you re-read paragraphs to understand them?
    - ☐ Rarely (1)
    - ☐ Occasionally (2)
    - ☐ Often (3)
    - ☐ Most of the time (4)

7. Do you get confused when given several instructions at once?
   - ☐ Rarely (1)
   - ☐ Occasionally (2)
   - ☐ Often (3)
   - ☐ Most of the time (4)

8. Do you make mistakes when taking down telephone messages?
   - ☐ Rarely (1)
   - ☐ Occasionally (2)
   - ☐ Often (3)
   - ☐ Most of the time (4)

9. Do you find it difficult to find the right word to say?
   - ☐ Rarely (1)
   - ☐ Occasionally (2)
   - ☐ Often (3)
   - ☐ Most of the time (4)

10. How often do you think of creative solutions to problems?
   - ☐ Rarely (1)
   - ☐ Occasionally (2)
   - ☐ Often (3)
   - ☐ Most of the time (4)

11. How easy do you find it to sound out words such as el-e-phant?
   - ☐ Easy (3)
   - ☐ Challenging (6)
   - ☐ Difficult (9)
   - ☐ Very difficult (12)

12. When writing, do you find it difficult to organise thoughts on paper?
   - ☐ Easy (2)
   - ☐ Challenging (3)
   - ☐ Difficult (4)
   - ☐ Very difficult (8)

13. Did you learn your multiplication tables easily?
   - ☐ Easy (2)
   - ☐ Challenging (3)
   - ☐ Difficult (4)
   - ☐ Very difficult (8)

14. How easy do you find it to recite the alphabet?

- ☐ Easy (1)
- ☐ Challenging (2)
- ☐ Difficult (3)
- ☐ Very difficult (4)

15. How hard do you find it to read aloud?

- ☐ Easy (1)
- ☐ Challenging (2)
- ☐ Difficult (3)
- ☐ Very difficult (4)

Results:
A score of less that 45: this is consistent with results of somebody who is not dyslexic
A score 45-60: this shows signs consistent with mild dyslexia.
A score greater than 60: this is consistent with moderate or severe dyslexia

Note that most of the items in the checklist can provide indications of where problems may lie, even though they do not appear to be literacy related questions. However, one needs to be cautious, since each question may be affected by several cognitive processes. As an example “How easy do you find it to sound out words such as el-e-phant?” suggests that the individual may have phonological manipulation difficulties, “Do you confuse visually similar words such as cat and cot?” suggests orthographic confusion, and “Do you confuse the names of objects, for example table for chair?” suggests semantic confusion. Similarly, short term memory problems may account for certain responses to “Do you get confused when given several instructions at once?” and “Do you make mistakes when taking down telephone messages?”. Some questions are more complex, and it may be difficult to distinguish between components. For example, is a difficulty with map reading to do decoding of orthographic (or ideographic) information or visual/spatial awareness. These comment should not be seen to suggest that the checklist should be used for assessment, but that there is a logical link between the definition of dyslexia and the response to questions in the checklist. Note also that many experienced assessors are more concerned as to how the individual responds to the question, rather than the actual response given.

The Role of IQ

For historic reasons which need not be discussed here, the IQ has gained an illogical status in the assessment of the dyslexic individual. Although there may have been some rationale for the use of the IQ test in the early days (early 1970s) to distinguish dyslexia from more general difficulties, three decades of research have shown it to be irrelevant in both in the categorisation of dyslexia and in the understanding of strengths and weaknesses of those with literacy difficulties. However, simple logic can succinctly explain why the IQ is not required in the assessment of the dyslexic individual (Siegel and Smythe, 2004):

Logic statement 1

1. The IQ-reading discrepancy hypothesis assumes a difference between IQ and reading achievement that is unexpected.
2. The fact that it is unexpected is based purely on the IQ level, and suggests that the IQ should predict reading ability.
3. But the fact that the reading ability does not always equal the IQ, since there is a discrepancy, demonstrates that IQ cannot predict reading ability, and thereby invalidates the assumption made in (2).
4. Therefore the discrepancy hypothesis is invalid.

Logic statement 2

1. The only tests that can determine dyslexia are those that confirm the diagnosis with respect to the definition
2. The definition states dyslexia is defined by fluency and accuracy of reading.
3. An IQ test does not measure fluency and accuracy of reading
4. Therefore, a measure of IQ is not required to determine if an individual is dyslexic.

Another counter argument to the inclusion of IQ in a test for those at university is that if they have already demonstrated sufficient skills to enter the university, then surely the fact that they have been accepted is demonstration enough of their intellectual ability. Put differently, those who suggest it is important to measure IQ are saying that the entrance qualifications are insufficient to demonstrate intelligence.

Social and emotional issues

Social and emotional issues are not areas which can be easily measured. There are a number of checklists but given the variability of the dyslexic individual, they are rarely as important as a sound basis in counselling which allow an understanding of the real cause of the social and emotional problems. Every practitioner and assessor should have a clear understanding of the issues, and the extent to which many dyslexics will be unaware of the problems and reluctant to talk about them. Empathy, developed through experience of working with other dyslexics, is crucial to understanding of how

best to provide support. However, never forget that there may be a time when a specialist should be called in to help with some of the more serious issues. Dyslexia affects many areas, and while practicalities (and finance) often mean that the assessor is a one-person multidisciplinary team, there may be a need to refer the individual for specialist assessment for emotional and other issues, as well as comorbid problems such as dyspraxia, ADHD and Asperger's. When referring an individual to another specialist, it is important that case notes accompany the individual. In the same way the dyslexia specialist should not be expect to have a full understanding of psychotherapy, so the psychotherapist should not be expected to have a full understanding of dyslexia. Without the case notes, they may assign difficulties to inappropriate sources.

Assessment protocol

It may be argued that if the definition on which you base decisions is symptom based, then all you need is the attainment components. However, if the definition states causal components, then you must demonstrate that the causes of the individuals difficulties are those specified in the definition. The following may be considered a starting point for the development of a protocol for identification of the difficulties of the dyslexic individual, and may be used to develop a support program with respect to the literacy related difficulties. It should not be seen as an exhaustive list, and other areas such as emotional and behavioural issues (e.g. the response to pressure in examinations) should not be ignored. As noted above, both fluency and accuracy should be measured in many of these tests.

Note that some tests offers information to understand the difficulties, but does not necessarily provide additional information to assist in the development of the individual education plan. However, they may help explain some of the other issues. An example would be the digit span test to help understand the auditory memory components. Knowing the individual has short term memory problems may help the assessor focus on development of strategies to assist the memory components of learning. Some assessors may wish to include tests which show cognitive strengths (e.g. block design). These are not required for the assessment of dyslexia, or the development of the individual education plan. However, any good assessment will include additional items which may provide information on the student's strengths which may be used where appropriate to support their weaknesses.

As discussed earlier, accuracy as well as fluency needs to be clearly demonstrated. As well as an overall score, an analysis of errors should form part of a comprehensive assessment. (For example: Is the spelling phonologically correct but showing evidence of visual memory problems - education spelled as educashun?) These analyses frequently provide additional information which may feed the recommendations.

Attainment – Reading – single word
Single word reading takes the word from the context. Therefore it may be deduced if the individual is reading the word or guessing from the context.

Attainment – Reading - non-words
Non-words are constructed from letters strings that are legitimate in the given orthography, but are novel, and therefore will not have been seen before. Unless the individual understands the orthographic-phonological rules, the will not know how to decode the words since they will have no visual record to use as an alternative strategy. Every individual should be able to use analogy and phonological skills to read the word. However, it may be important to not only look at accuracy but also fluency (or speed), particularly in a transparent language. It may also be important to confirm a full knowledge of letter-sound correspondence.

Attainment – Reading continuous text
With the adult it is frequently important to look at the reading of continuous prose. Internal rehearsal can mask the fluency problems with single word reading. However, it is more difficult to mask the issues in a continuous prose.

Attainment – "Non-word" reading passage
Some tests have been developed which intersperse non-words into continuous prose. This combines the difficulties of both fluency and accuracy.

Attainment – Spelling words
Words need to be chosen with respect to frequency and linguistic complexity. A test for adults should include not only common words, but also challenging words that reflect the diversity of the orthography. To avoid any ambiguity, the nature of the task is usually say the word, then a sentence containing a word, and finally the word again.

Attainment – Spelling non-words
By using non-words, the dyslexic is challenged in their ability to encode the spoken language into a written format. Frequently, strategies are learnt that provide a link between the phonological representation and the orthographic form for common and regular words. However, to spell non-words, where no direct link can have been formed, the only way to spell the non-word is through the use of letter-sound correspondence and analogy at all levels including the phoneme, rhymes and consonant clusters. These words may also be given in sentences, with the children told that they may not know all of the words.

Attainment – Reading comprehension
Many dyslexic individuals put so much effort into the decoding of the written word that they have no resources left to retain or decode the meaning from what they have just read. This may be understood from this task, of which

there are a number of variants. In principle, the individual reads a passage and then answers questions, sometimes with the passage removed from sightand sometimes with it present. Although there is a significant memory component, strategies can be developed which allow the individual to recall longer passages. An example would be to visualise what is going on as the individual is reading. Often these tests are timed; so that the individual may not finish the test in the allotted time. Some dyslexics read slowly but they answer the questions correctly that they have time to answer. However, this is not enough for a good score.

Auditory - Digit span
This is one of the most frequently used test around the world for identification of the dyslexic individual. However, it is important to acknowledge the differences in different languages, and that the seven digits often quoted for English is not true for other languages. For example, in Chinese, the norm is nine digits. The reason for this is that Chinese numbers (syllables) are shorter. Also in Chinese all numbers are monosyllabic. However, in English “seven” is bi-syllabic. In Filipino all number words are bi-syllabic except “dalawa” (two). In Hungarian, four number words are monosyllabic and five are bi-syllabic. Thus it is important to consider norms for the particular language. Note that this test can also be very useful when assessing multilingual individuals as it helps confirmation. However, this is only possible when a speaker of that language is available, or when a computerised sound presentation version can be used, with a written response. An oral response may also be possible if it is recorded for later analysis.

Auditory - Sound discrimination
This task may be considered a hearing test, but with a specific language context. Items need to be chosen with care to ensure that they are representative of the language, and provide sufficient difficulty to test the skills of the individual. The phoneme differentiation should be set at the beginning, end and medial positions. Specific phonemes should be considered when the multilingual individual is being tested. For example, the Gujarati speaker has problems with v/f differentiation, e.g. van/fan. Therefore this should be included where this language group is being considered. Similarly Japanese have problems with l/r (e.g. lap/rap) and Spaniards have problems with p/b (pin/bin). However, their ability to differentiate may be affected by where in the word the phoneme comes.

Visual processing - Copying tasks
This task is usually reserved for children, but may be included with adults to eliminate other problems, and to help the assessment where motor skills may be an issue. It usually includes a series of shapes of increasing complexity that are to be copied.

Visual processing - Shape from memory
The task involves showing the individual a shape for a short duration, and then asking them to reproduce it. Less complex tasks may need only a five second exposure, while more time (for example, one minute) may be offered for more complex shapes. It is often informative to not only see the result, but also to find out how it was achieved.

Working memory - Reverse digit span
This task is simple to construct as it involves only the auditory presentation of numbers. The task become complex as the individual must repeat them in reverse order.

Working memory - Counting backwards
This task, to count backwards from 100 in 3's, is simple to perform, but there are no norms. However, given the apparent simplicity of the task, it is reasonable to assume that much of the loading will be on working memory – that is the ability to do the calculation and retrieve the words before saying them.

Working memory – Spoonerisms
The high level of both phonological manipulation and working memory make this a good quick task for identifying those at risk. The task involves reversing the first phonemes of two words. (E.g. RED HAT becomes HEAD RAT) However, few norms exist for this task. Although the complex nature of the task can make it difficult to interpret, as well as there being a possible strong cultural bias in the task, it may be used by some as a quick indicator.

Rapid naming - Rapid naming – picture
Pictures provide semantic representation. Although a number of versions of this task exist, including where there are four items repeated many times, and twenty items repeated twice, it is often not the overall time taken that is important. Many dyslexics demonstrate fluency difficulties – that is, they do not say the words in a regular rhythm even thought they clearly know the names. Because fluency can be more important than timing, this can be used for evaluation of the bilingual individual using their first language.

Rapid naming - Rapid naming – number
This test is different from the picture naming task because it is based on an orthographic representation, and therefore taps the access to the orthographic lexicon. Responses to this task may be different from the picture naming task. Other versions do exist, including rapid naming of colours, letters and Chinese characters. Each will give a different response, but usually just one orthographic based task is required. This task is particularly useful when working with multilingual individuals, since they can perform it in their preferred language. Fluency is arguably the important issue, rather than the time taken.

Lexical – Phonological – Alliteration
Although more important with children, this task should not be ignored especially for those who learned to read late in life. There are variations on this, including the identification/deletion of the first phoneme which may be followed by a vowel, or may be part of a digraph.

Lexical – Phonological - Rhyme
There is much debate about the importance of the rhyme unit in learning to read in transparent languages. It should be assumed that in non-transparent languages such as English, the rhyme unit is important from the start. However, in transparent language, the large unit such as rhymes become important when it is not longer possible to become a more fluent reader based only on rapid phoneme-grapheme reading.

Lexical – Phonological - Phoneme segmentation
There are a series of segmentation and manipulation tasks such as initial and final phoneme deletion which may be used to identify the ability of the individual to manipulate the language at a level usually seen as necessary to develop competency in literacy skills.

Lexical – Orthographic - Orthographic choice
Literacy tasks that provide choices can be helpful in understanding the sophistication of the orthographic lexicon. An example of this task is Olson's Orthographic Choices, which has two forms: a) where two words are used of which only one is spelled correctly, but they sound the same (e.g. munk/monk) and b) there two words are written, but only one sounds like a real word when spoken (e.g. birf/berd). This task is not possible in a transparent language.

Lexical – Orthographic - Letter and phoneme identification
It is easy to make assumptions about individuals, but it is important to check all aspects. Letter identification may be missed as an individual may be reading words as wholes. Although the deficit may become apparent in a non-word reading task, this task allows confirmation of where the problems may arise.

Lexical – Semantic - Vocabulary test
Sometime it may be necessary to demonstrate that the vocabulary is as good as expected: for example, with the multilingual individual. The test may be given in several forms. These include: a) providing the definition of a word, and b) choosing a picture from a set which best illustrates the spoken word.

Lexical – Semantic - Verbal fluency
Several versions exist. An example would be to name as many words beginning with a given letter of the alphabet.

Lexical – Semantic - Semantic fluency
An example of this task would be to name as many animals as possible. It may be considered a measure of the way in which words are classified, and may be retrieved.

Motor skills - Copying task
Shape copying as well as shape from memory, tap the hand-eye coordination skills. It may suggest the possibility of problems in this area.

Motor skills - Handwriting quality
Although handwriting quality is significantly influenced by early teaching, failure to have good handwriting as an adult may have a significant impact on the learning environment, including the ability to read what one has written, and the ability of others to read one's writing. Furthermore, writing may frequently be a trade off between writing quality and spelling. The more resources that are used for writing quality, the less will be available for spelling and content.

Motor skills - Motor coordination task
There are many different tasks that may be used. These include Oseretsky's task (a "you follow what I do" type of motor task) and balance tasks.

Other - Free writing
This will show the ability to order thoughts, handwriting ability and spelling. Frequently time limits the amount that can be written in the test circumstances. Therefore prior writing may also be important. However, due consideration should be given to what is the normal working environment. If the computer has been the normal way of writing for some time, a free writing task may be irrelevant and even misleading.

Other - One minute writing
This is can be in several forms, but a sentence copying task is the most informative. If the word is not encoded or remembered, progress can be slow. As with many of these tasks, observation of the way the task is performed is also important.

Other - Maths ability
Many individuals would like a maths test included in the assessment for reasons of general interest, or because their study includes some maths. Unlike literacy, maths cannot be done correctly if just one item is misread or done incorrectly. It is very exact, and hierarchical in nature. There are many aspects of maths that may be tested, including multiplication tables, correct use of operands, memory skills (including mental maths) and understanding the concepts and terms.

Note that there is no listening comprehension since these are generally only test of memory, and not comprehension.

Although the choice of tasks is important, where they come from is not important, provided they measure what they claim to measure. Thus a digit span task may come from any source since the norms should all be the same.

Multilingualism and dyslexia

Increasingly there is a need to test the multilingual dyslexic, not only for work but also for education. Within the EU the restrictions on where to learn are no longer defined by national (and implicitly linguistic) boundaries, particularly where the student is self-financing. If the dyslexic multilingual individual is to be assessed, then questions become “In what language should we test?” The answer is that it depends on the purpose of the assessment. If it is to provide support in the language of tuition, then it may be argued that the assessment should be with respect to the difficulties that are encountered in the language of tuition. Care must then be taken in the interpretation to ensure that the analysis takes account of language exposure, and thereby differentiate between a lack of ability due to dyslexia and lack of exposure, appropriate teaching or other reasons. Frequently, it may be possible to test the individual in their first language to confirm the analysis.

Put in practical terms, experience shown that many Chinese are taught and acquire English using rote learning methods, with little understanding of phonics. Therefore it is necessary to account for the learning methods when interpreting the results. However, it may be suggested that if the individual does not have phonological manipulation skills, are they not still entitled to support in that area, even though they are not dyslexic? The answer must be context dependent.

The use of computers has been found to be useful in the assessment of some multilingual individuals, as it can allow the presentation of pre-recorded auditory based tests as well as instructions to be delivered in the first language.

Test development

In order for the tests to be used in different contexts, certain modifications may have to be made to allow it to conform to the linguistic and cultural requirements of the country in question. The tests may be classified into three types:

a) Those that needed no translation (eg rhythm tapping and visual tasks)

b) Those that needed no “translation”, but local words needed to be used in the test which may in turn have affected the test (eg digit span, due to the different length of digit sounds in each language).

c) Those that needed specific translation and modification (eg spelling, reading, rhyme and alliteration tasks).

It is important to understand the principles of test development when preparing to create a new test. Thus “Spelling” is not about translating from another language to another, but needs an understanding of the linguistic components including not only frequency but also orthographic structure.

Two types of tests may be needed:

Normed tests – where it is necessary to know how the individual response in comparison to the rest of the population.

Criterion based test – these are used where all that matters is what the individual can and cannot do. It does not matter how others perform.

When resources (financial, human and other) have to be allocated, it is normally necessary to determine the needs of any individual with respect to the needs of others, and thereby justify the allocation. In this case, it is important to used tests that have been trialled on the entire population. An example would be a rhyming task, which most adults should score well. However, if the test are to determine current levels of functioning, criteria based tests may be used. An example of such a test may be a maths multiplication test. For development of the individual education plan, it does not matter how others achieve in this task, if the individual cannot perform the task, then, at least as an adult, they should be taught the task. No norms are required.

Note that there is no such thing as a “culture fair” test. Some people suggest that some of the visual reasoning tasks are “culture fair” but fail to understand that the nature of the task is implicit to the culture. So a test such as matrices is often implicitly incorporated into European games and therefore would disadvantage any non-European.

For quick reference, the test may be analysed as follows:

Test requiring linguistic modifications

Reading – single word
Reading - non-words
Reading continuous text
Nonsense reading passage
Spelling words
Spelling non-words
Reading comprehension
Sound discrimination
Spoonerisms
Alliteration
Rhyme

Phoneme segmentation
Orthographic choice
Vocabulary test

Test requiring local adaptation with minimal modifications

Letter-sound correspondence
Digit span
Reverse digit span
Counting backwards
Verbal fluency
Semantic fluency
One minute writing

Test requiring no adaptation (except instructions)

Shape from memory
Copying tasks
Rapid naming – picture
Rapid naming – number
Copying task
Handwriting quality
Motor coordination task
Free writing

Computerised assessment

Many people rightly question the need to pay high fees to specialist to perform tasks which could be carried out by almost anybody. What the professional adds is the interpretation, and the subtle ways in which the individual responds, from the words they speak during assessment, to the way they sit.

There are now a number of computer based screening tools available in Europe which provide information with respect to a category (dyslexic or not), learner preferences and a number of cognitive abilities. However, their range is somewhat limited.

5. Dyspraxia, ADHD and Aspergers – or how people come in all shapes and sizes and one size cannot fit all.

Dr Amanda Kirby

Introduction

The assumption that the multiple disorders have independent etiologies cannot yet be proved. In fact, the evidence for very high overlap of developmental disorders (also known as specific learning difficulties) may be an indication that they are not independent but co-exist with one another and cannot be discretely separated out.

This chapter is designed to examine the evidence gathered regarding the understanding of different professional group's understanding of a number labels that are currently used in both educational and health settings. It then considers, in light of this work, whether the current system of labelling individuals with specific learning difficulties is the way forward from an educational perspective and from a position of inclusive practices and the social model of disability and how the compartmentalization that this causes does not meet the needs of the " whole" person. It proposes an alternative model of working.

Note that historically much of the work has been done on children. However, more recent research has highlighted these issues amongst adults. Furthermore, the role of technology will be discussed, and how it will have an impact on these individual, and those seeking to identify and support them.

Overlapping disorders

There is evidence from Gillberg (1998) and other researchers such as Pitcher, Rasta, Green to show the overlap of Developmental Coordination Difficulties (DCD) with other neurodevelopmental disorders and that the "pure" DCD child is indeed rare (Kaplan 1998) . However, managing the whole child with a range of functional difficulties remains a challenge for the parent of the child and for health and educational professionals working with the family.

Growth in labelling

There has been a growth in interest and understanding of specific learning difficulties over the past twenty to thirty years. In the last few years it has seemed as if there has been a "labelling industry" arising with new categorizations such as dyscalculia, and DAMP (Deficit of Attention, Motor and Perceptual difficulties) appearing on the scene. There has been an increased knowledge of this field of practice leading to an abundance of different intervention programmes to support children with these difficulties. In some schools there are now motor programmes for children with DCD, social skills programmes for children with Asperger's syndrome and dyslexia support schemes for children with dyslexia.

While recognition by health, educational and parental organisations has helped to raise the profile of specific learning difficulties in individual compartments, the inconsistent use of terminology between professionals and parents remains a problem. Peters et al. (1999) showed that health and educational professionals use different labels to mean different things with regard to DCD, clumsiness and dyspraxia.

A recent study looking at the knowledge of General Practitioners around specific learning difficulties showed that 81% of the cohort did not know the term DAMP, another 17% could not define Aspergers Syndrome and 39% did not know what DCD and 36% could not define dyslexia (Kirby, in preparation). This lack of knowledge on the part of the health professional, who may be the gate keeper to services, combined with compartmentalization of provision may leave parents feeling both frustrated and confused.

Parents and individuals are often anxious to seek out the label, often believing that once given, that support and treatment will follow. In the current system, for many individuals there is a need to label in order to access help and support. However, many, if not most, individuals with a developmental problem qualify for more than one diagnostic label and this can cause confusion for educational professionals and support staff deciding on the type of support required. For example, a population study showed that 23% of children showed signs of DCD, 8% met criteria for ADHD, and 19% were categorized as dyslexic (Kaplan, Crawford, Wilson & Dewey, 1997 – NB NO comparable adult research exists.). Nearly 25% of the affected children were found to have all three, while 10% had both ADHD and DCD, and 22% had dyslexia and DCD. One label may be more socially acceptable than another and gain greater support and remediation for the individual.

Who labels the individual?

There is a debate in many areas over who should undertake both the initial screening and assessment and the subsequent support and whether this should be the responsibility of education or health professionals. In the past there has even been an element of competition and territory setting with regard to who should undertake this. Health has “owned” ADHD, Asperger’s Syndrome and DCD, and education has “ owned” dyslexia. This has lead to compartmentalization in training of professionals and provision of services. While this debate continues and shortages in allied health professionals prevail, there are pragmatic management issues that need solutions, otherwise individuals remain having difficulties with little or no support. This is especially true for those with overlapping difficulties who may end up going from service to service.

In the UK, the recent green paper “Every child matters” (DFES 2003) however has advocated fully co-ordinated service provision and a holistic approach to the needs of the child. It also discusses the need for a “one–stop shop” and a “seamless service”

Managing the Services

Professional Shortages
In the UK there is currently a national shortfall of allied health professions, in particular Occupational Therapists, Speech and Language Therapists and Physiotherapists, and this appears to be reflected across Europe. This shortage has a knock on effect with even fewer people available to train others in suitable programmes of support and being able to come into schools and colleges to work in an advisory role. It also has implications for the development of interdisciplinary working.

Knowledge Shortages
With shortages of trainers and lack of standardization in models of training looking at neurodevelopmental disorders overall, knowledge can vary not only between countries, but also within a country. Training programmes are often developed at a local level and the information may influence local approaches and may not always be evidence based. Where available, training is usually separated by profession e.g. different training for teachers and health professionals and even separation in developmental disorder training; for example, training in ADHD, and Dyslexia separated from DCD. This may add to the confusion in how to best manage the child within the classroom setting when the teacher has to deal with a real child who may have several labels.

In order to resolve the training gaps, an example of an alternative delivery mechanism to enable information to reach further across the UK and internationally has been developed by the Dyscovery Centre in Wales, in partnership with the University of Wales. There are a number of formats such as an online delivered (internet based) certificate as a part of a Masters Degree (SEN) programme. This provides the possibility for a mix of professionals to interchange their views as a part of the course process. (Umble et al., 2003)

Delivery of services
It is of interest that a paper by Greydanus and colleagues (2003) states that “Management of ADHD should include a multi-modal approach, involving appropriate educational interventions, appropriate psychological management of the patient and judicious use of medications.” This is as true in the area of DCD or dyslexia. What is needed is a range of services, each offering a part and combining to provide a holistic approach.

Developing models of practice
A transdisciplinary model has been developed and delivered with Bridgend Education Authority and now extended to adult services. These are based on The Dyscovery Model of Practice. (Kirby 2002) This model considers a joint health and educational approach and intervention set within the context of the educational setting. It is goal orientated and has a cognitive approach. The core elements of the programme are a) tailored to the needs of the individual, b) working to improve the individual's self esteem and self perceptions and c) increasing communication between health and educational professionals and the parents.

Technology and the future
As well as traditional methods of assessment and support, we also need to consider the use of information and communication technology. The technology may be useful for the screening and assessing individuals as well as training professionals and, providing assisting technology to help the individuals.

New technologies could:

- provide solutions to man power shortages
- deliver screening effectively to plan services and target who should receive them
- deliver assessment and monitoring services
- be a route to training in this area.

Examples of this:

- ***A computerised screening tool*** for a baseline measure of the range of neurodevelopmental difficulties, allowing for data to be collected in a more uniform way nationally and to help target services appropriately and recognize the individual and provide tailored support, rather than treating the label. (Kirby and Smythe, in press)

In the future screening programmes can look across at all developmental areas and ensure that a one-stop screen takes place which may be both more cost and time effective. However, it is important to consider that there may be a further need to repeat screening at other times apart from school entry. Use of screening tools at school entry and at different points in the school career need to be uniform to ensure that all concerned are measuring the same thing and there is a process of referral with identification criteria for onward referral. If this is undertaken in school, a functional approach allowing for intervention, even while waiting for medical assessment, limits discrimination against those with and without a label

• ***Webcam*** delivered services could be used especially for remote or rural settings or where providing full teams may be less cost effective. For example, a project using tele-occupational therapy is currently being conducted by Liu and Miyazaki (2000) in Canada. This methodology could also be extended to using web cameras in classrooms and even in the child's home (with permission) to have a real understanding of the functional difficulties and for monitoring treatment programmes.

The next ten years will be exciting for the management of DCD and the related overlapping disorders across Europe. There are still huge gaps in research into the management of the whole child with complex needs and we continue to often examine only one aspect in isolation of the other factors. Management is a challenge to both researchers and clinicians at all levels but we must not lose sight of the child and the need for a pragmatic approach to helping the whole child and not just isolated parts. As children grow up with the labels being used we need to consider how IT can help not just those in education but moving into employment and into further education as well.

IT developments in the future can offer the university and its students advantages:

- Identification of difficulties using computerised screening- this is useful for planning for the university what provision will be required for budgeting and staff support and will identify those earlier on in their university stay to minimise drop offs.
- Opportunity to be offered help discretely via email and web access
- IT solutions for difficulties in all areas such as co-ordination, recording, spelling, organisation and socialisation
- Specific support programmes to help through the use of IT – such as social skills programmes.

Increasing collaboration across Europe will lead to greater sharing of good practice allowing for more than just pockets of good practice across the EU which to date have not been shared due to communication barriers.

This provides greater need to use IT to communicate ideas and share best practice and offers opportunities for cross country working using experts from different areas to deliver it- this can become a global village approach. However if we are to meet the needs of the individual in university and not just the labels it is important that consideration is made of the overlap of specific learning difficulties and individuals "whole" needs are addressed and not just one area of difficulty. If this is not undertaken we may be " treating "an elbow problem for example while missing out that the back and the legs have difficulties also!

6. Dyslexia and Tertiary Education: Training For Assessors – Guidelines for Europe

Dr. Gavin Reid

This chapter will focus on some of the key issues in dyslexia and tertiary education and specifically the assessment process. Some guidance will be offered, although it is fair to say that the range of awareness and the impact this has on policy and practice varies considerably, particularly within the European Community. This difference represents an area of inequality and is in fact now more obvious within the new enlarged European Community.

This chapter will therefore address some of the key issues in dyslexia assessment and discuss key questions relating to the nature of dyslexia assessment beyond school. One of the key questions that is of considerable importance is that relating to 'who'. Who within the college or university should claim responsibility for the assessment and what type of training would be desirable for those who conduct the assessment? Some reference will be made to the developments within the UK stemming from the working party report on Higher Education (Singleton 1999) and the preliminary findings from a current working party in this area (DfES 2004).

Key Issues

The key issues outlined here provide a framework for understanding dyslexia. This is essential not only for the individuals responsible for the assessment, but also for all staff who come into contact with the student. These points below therefore have implications for training.

- **Dyslexia is individual** – this means that people with dyslexia may have slightly different characteristics from each other. These characteristics can have a varying impact on the learner. In some learners the disability may not be too noticeable, but in others it can be very obvious. Dyslexia therefore can be seen within a continuum from mild to severe. This means that some students may be well into their course before dyslexia is identified simply because they have been able to compensate, to an extent, for their dyslexia.

- **Dyslexia relates to how information is processed –** this means that dyslexia involves more than reading, but affects learning and how all information is processed. This includes oral instructions as the student may not fully understand, or remember oral instructions.

- **People with dyslexia can have difficulty in displaying their skills and knowledge in written work.**
  In our examination system student performances, are usually judged through the written mode. Yet for students with dyslexia this can represent

their weakest area means of presenting information. Often writing can be laborious and tedious for the dyslexic student.

- **People with dyslexia can have difficulty learning through the auditory modality i.e. through listening**

  There are many ways of learning, particularly today with computer software tools revolutionising the student learning. Yet in many cases we still rely on what is called the auditory modality – that means the persons ability to listen and understand through sound, rather than through pictures (visual) or through experience (kinaesthetic). It is important that students with dyslexia are provided with the support to obtain information using their preferred learning style.

- **Students with dyslexia can have difficulty in remembering information.** This can apply to short-term and working memory and means it can affect remembering oral instructions especially if a list of items is presented at the same time. The short term, or working memory, can only hold a limited amount of information at any one time, but children and adults with dyslexia can have difficulty in remembering accurately, even a limited amount, so it is best to provide only one instruction at any one time.

- **Students with dyslexia may have difficulty in remembering information**
  This can be especially important when recalling a sequence of events as in history. Students with dyslexia may have difficulty in organising information and this can affect both how efficiently information is remembered and how they can present the information to others. This will very likely influence their performance in examinations unless some additional support is available.

- **Students with dyslexia need more time to process information.**
  This is very characteristic of dyslexia as usually adults with dyslexia will take longer to process information because they may take an indirect route to arrive at an answer. This indirect route is often their personal preference for learning and this needs to be accepted. The role of the support tutor is to help the student use their preferences more efficiently.

- **They will usually have difficulties with reading and spelling accuracy and fluency.**
  You will note that the word usually is mentioned here. This is because not every adult with dyslexia will have difficulty in reading and spelling. Some compensate for a reading difficulty by becoming very adept at using context and tend to read for meaning

Assessment in Context

It is important that assessment is not seen in isolation. Assessment, therefore, needs to be linked to support. Most countries now have legislation to support all students with a recognised disability and dyslexia is recognised in terms of the legislation as a disability.

Most universities have guidance for students with dyslexia including those who suspect they might have dyslexia, but have not yet been diagnosed. This guidance can normally be accessed from the university web page. For example Warwick University in the U.K. have information on what dyslexia is and what students can and should do. For example the university web site indicates that *"Dyslexic students often find if difficult to give oral presentations. You may notice:*

- *increased anxiety if asked to present to a seminar group,*
- *difficulty reading from notes and a lack of fluency,*
- *a tendency to speak very fast.*

It is common to notice a marked discrepancy between seminar performance and written work. Students may also display short-term memory problems, making note-taking and copying from OHTs very difficult. Information may be taken down incorrectly.
Students with dyslexia often work very hard, but their work may appear to show signs of carelessness. They find it difficult to proof-read and may not spot seemingly obvious mistakes". (Warwick University UK (www2.warwick.ac.uk/services/tutors/disability/)

It is important of course to remember that the degree of severity of dyslexia can vary considerably. But all universities in the U.K. will have a disability co-ordinator and there is also an equivalent in the United States and in most other countries. The co-ordinator is a good point of contact for the student and can help with preparation and planning in advance of starting the course. This should be seen as a priority for all European countries.

Legislation

The legislation governing support for dyslexic students in the U.K. is the Special Educational Needs and Disability Act, 2001 which forms Part IV of the Disability Discrimination Act.
According to the Act, discrimination can occur in two ways:

- By unjustifiably treating a disabled person less favourably for a reason relating to a person's disability.
- By failing to make a reasonable adjustment to avoid substantial disadvantage to the disabled person.

It is therefore unlawful for a responsible body to discriminate against a disabled person:

- in the arrangements it makes for admitting or enrolling students with a disability to their institution (this will occur from when the student has made their first enquiry about a course),
- in the terms on which it offers to admit or enrol a person,
- by refusing or deliberately omitting to accept an application for admissions or enrolment,
- in the provision of student services to those with a disability. These services might include:
    - teaching, including classes, lectures, seminars, practical sessions, field trips,
    - learning facilities such as classrooms, lecture theatres, laboratories,
    - learning equipment and materials such as laboratory equipment, computer facilities, class handouts and lecture notes,
    - arranging study abroad or work placements
    - research degrees and research facilities.
    - informal/optional study skills sessions
    - distance learning courses and support.
    - libraries, learning centres and information centres and their resources.
    - careers advice and training.

Factors to consider

Structured System of Assessment

Reid and Kirk (2001) suggest that a structured system of identification and assessment is advantageous and could include;

- initial screening, interview;
- cognitive assessment
- diagnostic assessment
- workplace/ course needs assessment/
- implications for the course, student and/or workplace
- recommendations for support
- user friendly report which should have a clear summary attached.

This is important as it ensures a level of equality for all students and provides clear guidance to course tutors and student advisors and students themselves.

Suitable Qualifications and Training for those Assessing Specific Learning Difficulties in Higher Education – A UK perspective

The current situation in the U.K. following on from the Singleton Report (Singleton 1999), is that diagnostic assessments should be carried out by chartered psychologists, or by specialist teachers holding a British Dyslexia Association recognised qualification. However, in practice many Local

Education Authorities do not accept reports from specialist teachers. They find the quality of reports and assessments are highly variable from both specialist teachers and psychologists.

In the UK a Working Party was convened in 2003 to make recommendations in relation to appropriate tests, appropriate report format and appropriate training and qualifications for specialist assessors. A recurrent theme in the working party discussions was that assessments require *interpretation* of test results and integration of this with other relevant information in order to reach a conclusion. The choice of tests and the results are critical, but they do not tell the whole story. This is critical in relation to guidance on training as it implies that training of assessors relates to more than the tests used in the assessment. Assessors need to have a sound knowledge of dyslexia, of learning systems and learning styles. The working party recommended that assessors should be required to continually up-date their skills through continuing professional development. But just as importantly it was suggested that assessors should hold a practising certificate that would only be renewed on production of evidence of continuing good practice and Continuing Professional Development.

The draft report of the working party suggests that those providing assessments for the Disability Students Allowance will, by 2007, have to hold a Current Practising Certificate in SpLD Assessment. It is expected that all those conducting these assessments, chartered psychologists and specialist teachers, would conform to the standards and the recommendations set by the working party.

In order to gain a SpLD/Dyslexia Assessment Award the draft working party report suggests that candidates will be expected to be:

- **Qualified teachers** who hold Qualified Teacher Status (QTS) and are recognised by the General Teaching Council (or equivalent) ;or
- **Speech and language therapists** with appropriate professional qualifications and experience; or
- **Occupational therapists** with appropriate professional qualifications and experience; or
- **Educational psychologists** with appropriate professional qualifications and experience; or
- **Other psychologists** with appropriate professional qualifications and experience; or
- **Tutors, lecturers and learning support staff** who have successfully completed a BDA accredited course and who already have a minimum of 2 years teaching or support experience in an institution of further or higher education; or
- hold or be working concurrently toward a SpLD Teaching Qualification at Certificate level

Furthermore it is suggested that assessors must have at least 2 years experience working with the age range with which they are seeking the Assessment Award.

One of the key points of the draft working party report is the requirement for prospective assessors to undergo an accredited training course in dyslexia assessment. According to the draft working party report it is expected that an accredited course will enable the candidate to:

- Understand the nature of Specific Learning Difficulties and identify learners with Specific Learning Difficulties.
- Demonstrate an understanding of the affective issues observed in learners with Specific Learning Difficulties.
- Understand the theory and application of psychometric and educational assessment [The BPS Checklist of Competence in Educational Testing – Level A is a good model.]
- Identify methods and materials to screen, select and assess the needs of learners.
- Select appropriate assessment materials, administer tests correctly and interpret resulting data accurately.
- Produce professional reports written in a language easily accessible to non-specialists.
- Make teaching and learning and assessment recommendations that are directly linked to assessment findings and subject's needs.
- Understand current legal and professional issues, rules and regulations relating to, or affecting SpLD/dyslexic individuals.
- Complete relevant forms and reports, whatever the need of the subject.
- Understand all aspects of processing documentation and managing special arrangements for SpLD/dyslexic learners.
- Communicate effectively findings and implications of any assessments to relevant individuals both orally and in writing with due regard for building a positive framework.

An example of a model of a possible course (Reid 2003) is shown below:

A Model for Training (Reid 2003a)

The terms of the legislation are very far reaching and it is important that staff are fully trained to help students benefit from the potential impact of the legislation. Training is therefore of high importance and each country/institution should have a model to highlight the essential components of a training programme. This is very important in relation to identifying 'disabled' students needs as full and appropriate assessment is a crucial aspect in the development and implementation of an effective support system. A model for this is shown below but it is important to note that the model below is only one example, based on UK experiences (Reid 2001). It can

serve however as an example that can highlight some of the key principles in a training course for assessors.

Overview of Assessment

- Criteria
- Aims and rationale
- Purpose of assessment –what, why, how, effect
- Considerations – parents, students perspectives
- Inclusion
- Multi-lingualism
- Linking assessment with intervention
- Co-existence with other difficulties

Assessment – Practice

The following is a list of tests that should be understood and is not necessarily an endorsement of these tests not a recommendation that they need to be included in any evaluation. Fuller discussions of these will be found in literature dedicated to this area, including those cited in references.

Range of tests and strategies

- standardised, diagnostic, diagnostic spelling, numeracy, screening, phonological, observational, metacognitive

Standardised/ psychometric (psychologist)

- Wechsler tests, Wechsler dimensions where required
- Ability tests (e.g. British Ability Scales)
- Interpretation of reports

Diagnostic/ standardised

- Reading and spelling tests
- Miscue analysis

Screening

- Issues around screening
- Proactive screening
- Common screening tools (e.g. Bangor Dyslexia Screening Test, Dyslexia Adult Screening Test (DAST), Cognitive Profiling System (LADS))
- Visual tests
- Checklists

Tests of Attainments

- Wide Range Achievement Test
- Woodcock Reading Mastery
- Test of Word Reading Efficiency (TOWRE)

Ongoing course assessment
- Task analysis
- Identify the barriers to learning

Examinations
- Dyslexia- friendly assessment
- Special considerations

Metacognitive Assessment
- Assisted assessment/dynamic tests
- Self-report
- Role of multiple intelligences

Observational Assessment
- Criteria/ framework
- Structured interview
- Learning context - learning styles

Assessment –the Process

Models of Identification
- Expert/intervention model/ attainment discrepancy model
- Stage/ process model
- Models and policy
- Course and subject focussed models
- Monitoring and review
- A Framework for Assessment

Issues in assessment
- Linking assessment to support
- Roles of professionals
- Co-existence with other Sp.L.D's
- Career issues

As indicated above it is important to identify some of the key principles in a training course. In relation to assessment for dyslexia these should include:

- A theoretical understanding of dyslexia
- An understanding of different types of assessment
- A framework that highlights the process of assessment that will include other aspects apart from tests.
- An understanding of the role of tutors as part of the information gathering exercise.
- An understanding of the emotional needs of students with dyslexia.
- Recognition of learning differences and learning styles.

- Recognition and an understanding of the role of other professionals including career professionals.

Summary and key points

- An assessment should not be carried out in isolation. That is, the assessment needs to be contextualised for the course of study and for the needs of the student. The demands and the skills needed for different courses can vary considerably. Additionally the person conducting the assessment needs to know about some of the other factors which may influence the outcome of the assessment and the students performance in the course. Factors such as English as an additional language and factors relating to the students school and life experiences which may also influence course performances.

- It is important also to recognise that dyslexia is about how reading and other difficulties can affect individuals. This can contribute to low self-esteem and other difficulties that can affect students in many different ways (Reid 2004). It is important therefore to appreciate that constructive feedback following an assessment is beneficial for the student. Such feedback can make a considerable difference to the self-esteem of the student if handled sensitively.

- There are many different procedures that can be used by colleges and universities to identify students. In practice in the U.K. this is usually by referral to an educational psychologist who has experience at assessing dyslexia in adults. This latter point is very important because not all educational psychologists have experience at assessing for dyslexia and even less have experience with adults. An examination of the U.K. Directory of Chartered Psychologists (BPS 1999) shows only 27% of those providing educational psychology services indicated that they can perform dyslexia assessments on adults (Reid and Kirk 1999).

- Many universities and colleges in the U.K. have implemented screening procedure, prior to a full psychological assessment. Indeed some of these screening procedures are quite sophisticated and tests such as the dyslexia screening test can provide much of the information needed for a diagnostic evaluation of the students needs.

- In addition to the Dyslexia Screening Test computer screening procedures for dyslexia are also available. Computer based assessment can be the first line in identification, although they may not give a definitive diagnosis they can be useful as an initial screening. It is feasible that students can access the computer screening from a central data base within the college or university. Additionally checklists can also be used. Smythe and Everatt (2001) have developed a sophisticated checklist which takes into account

cognitive aspects as well as behavioural factors associated with study and work.

- Additionally a structured interview with the student is extremely valuable as a considerable amount of information can be obtained from this relating to the students study habits, strengths difficulties and apprehensions (Reid 2003).

Conclusion

Although the guidelines suggested in this chapter relate to assessment it is important that assessment is not viewed in isolation. The assessor needs to have a comprehensive theoretical understanding of dyslexia and other specific learning difficulties. This understanding will help them select appropriate tests and help them make an informed interpretation of the data that arises from the assessment.

It is also important to appreciate that there will be variations across Europe in the nature of the professionals who are seen to be responsible for assessment and indeed the available routes to assessment and support. The key point is that the guidelines for assessors should be clear, comprehensive and widely disseminated. This would mean that all assessors are operating to the same criteria and that students will be dealt with on an equitable basis. This is essential for every European country and certainly desirable for Europe as a united community.

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7. Supporting the dyslexic student at university – A case study of the University of Edinburgh, Scotland

Jane Kirk

Background

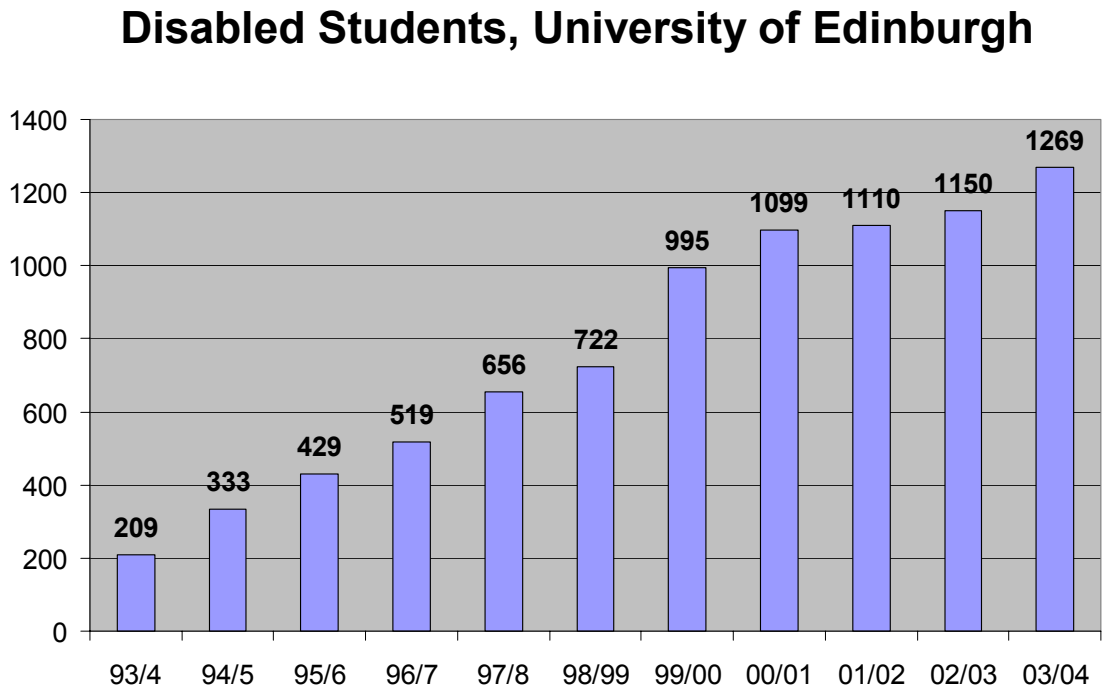
Higher education in Scotland is a publicly provided service, funded by the taxpayer, and without requiring students to pay fees. It enshrines the principle that the future well-being of the community requires public investment by the community in the cultivation of individual talents and skills of those who are then in a position to serve the public good. Given that commitment, it is essential that all who are capable of benefiting from the experience of higher education are admitted and that the obstacles that might stand in the way of participation are removed, in the individual as well as in the national interest.

The traditional pattern of higher education in Scotland was differentiated into three groups. There were 8 universities, some of them originating in the 15th and 16th centuries, and between them offering the full range of higher education opportunities in the arts and sciences, engineering, commerce, and the great professions of the law, medicine and the church. There were, in addition, 12 Central Institutions, controlled by central government and specialising in the applied sciences and vocational education. Finally, there were ten Colleges of Education, reduced to 5 in the mid-80s to reflect the decline in the school population, which concentrated on teacher education and associated fields such as community education and social work.

Following legislation in 1992 these three separate sectors of higher education were rationalised into a single group and brought under the financial control of the Scottish Higher Education Funding Council. That body receives funds from the Scottish Office and is responsible for allocating funds on a systematic basis, acting on advice from government, across some 25 individual institutions. Clearly, therefore, central government is in a position to control the development of these institutions of higher education: since the institutions are dependent on government for funds, government can ensure that funds are deployed in accordance with national educational policy.

One of the threads of public educational policy in egalitarian Scotland is a commitment to widening participation in higher education. That term usually implies that institutions should strive to attract those groups which are under-represented in higher education, and financial incentives are put in place to reward institutions which are successful in this respect. Among the groups, which are traditionally under-represented, are those with disabilities. Accordingly, the Scottish Higher Education Funding Council, acting on the policy advice of the government, has made special financial allocations to institutions to encourage them and to enable them to extend access to disabled students and to ensure that, when such students are admitted to a programme of study, they have the necessary technical and other forms of

support that enable them to complete their programme successfully. Thanks to the continuing financial support from the Funding Council, institutions have been able to undertake extensive programmes of refurbishment to ensure that their physical accommodation permitted full access, and that an infrastructure of support for students with disabilities, usually centred on a Disability Office, was in place.



Graph to show increase in numbers, 1993-2003

Legislation

The provisions of the Disability Discrimination Act (DDA), 1995, provided a powerful stimulus to this developing provision. It placed a clear duty on all governing bodies to ensure that all students, whether part-time or full-time, undergraduate or postgraduate, were protected by the provisions of the Act and that all the services provided by the institution fully met the requirements of the Act. In effect, the DDA obliged institutions to ensure that they provided a comprehensive service to all that was based on full access to equal opportunity.

The specific provisions of the DDA made it illegal for an institution to treat disabled students less favourably than others, or to fail to make “reasonable adjustments” to their services where disabled students would be placed at a substantial disadvantage compared to others, because of their disability. The

term “reasonable adjustment” referred to changes in provision that helped to alleviate a substantial disadvantage. Thus, the DDA conferred on those who were disabled a significant entitlement to appropriate support and services. Thus, for example, students with a hearing impairment would be entitled to ask any lecturer to wear a radio aid microphone; those with dyslexia were entitled to permission to record lectures on a digital recorder.

The DDA also made it clear that it was insufficient for institutions to wait until a disabled student was admitted before considering what form of reasonable adjustment to make. It was incumbent on institutions to anticipate what disabilities might be encountered in successive cohorts of students. The effect of this requirement was to mainstream provision for students with disabilities rather than to treat them as special cases calling for unusual forms of support. The effective institution, in the terms of the DDA, would be one that had the full range of support available for students already in place as part of a comprehensive structure of support catering for all students regardless of their needs. For example, in order to support dyslexic students, in all computer labs the machines would be programmed with dyslexia support software: TextHELP: read and write, to ensure their written language was accurate or Mind Genius, to help them in planning their coursework assignments.

Clearly, the DDA called for radical change on the part of institutions of higher education. The remainder of this chapter will be devoted to a discussion of how one university, a large institution offering the full range of university programmes, responded to the new expectations with specific regard to dyslexia.

Identification and assessment

A university’s response to students with dyslexia depends in the first place on accurate diagnosis: the university needs to establish the nature of the specific learning difficulty before it can offer appropriate forms of support.

Universities can be alerted to the existence of dyslexia in a student in one of two ways: firstly, as schools become more aware of the nature of specific learning difficulties and more experienced in providing appropriate support, some students will reach university with their specific learning difficulties already identified and with patterns of support already in place. In such cases the task of the university is to maintain and develop a system of support to which the student with dyslexia has become accustomed but has to be adjusted to the higher education context. However, there are many students who make their way through school with their difficulties undiagnosed and, presented with the increased demands of Higher Education, find that the

coping strategies they have used earlier are ineffective. Such students need to have an initial assessment for dyslexia.

For this second group of students the university needs to have in place systematic arrangements for the identification of specific learning difficulties. At the University of Edinburgh these arrangements have a number of stages. The first of these is the QuickScan screening test. This is a computerised, self-reporting test which provides the students with a report indicating their learning style and whether or not there are indicators of dyslexia. The second stage involves students in taking the LADS screening Test, which consists of four sub-tests each assessing a different processing skill. The third stage asks the student to undertake a piece of free writing for 15 minutes, an exercise which provides evidence of speed of processing, grammatical, syntactical and spelling difficulties.

If these three stages provide no positive evidence of dyslexia, but nevertheless suggest the student has processing difficulties, then the student will be offered the opportunity to be assessed by the dyslexia advisor using the DAST screening test. This is a well-established, standardised instrument which is widely used in Higher education in the UK.

Students who produce evidence that may be indicative of dyslexia in any of the three phases of diagnosis or in the DAST test are referred to a chartered educational psychologist for formal assessment. That is, the University acknowledges the obligation to determine whether or not specific learning difficulties exist before embarking on a programme of support. The importance of the formal assessment is that, if positive, it creates an entitlement for the student on the one hand to certain forms of support and on the other it imposes a duty on the University to provide that support.

Systems of Support

The University's Disability Office, through its Dyslexia Advisors, has a key role to play in the provision of support for students with dyslexia. They advise on specific examination arrangements so that, for example, students with dyslexia can have the use of a computer to complete their examinations as well as extra time; they arrange for students to have access to computers, software and other forms of technical support; they ensure that students have access to personal helpers, for example, proofreaders, note-takers or tutors; and they are available for regular consultation with students throughout their university careers, monitoring the progress of students and arranging for adjustments in the nature of the support provided whenever that is required.

	Total	V.I.	H.I.	Mo	M.H	U/S	Mult	Other	Dyslexia
Humanities and Social Sciences									
Arts	263	2	14	8	13	53	3	36	134
Divinity	36	3	2	1	1	8	3	3	15
Education	158	3	13	7	4	53	4	15	59
Law	35	2	1	1	1	9	3	7	11
Music	13	1	1	0	1	3	0	3	4
Social Science	281	8	5	4	5	49	5	36	169
Sub-total	*786*	*19*	*36*	*21*	*25*	*175*	*18*	*100*	*392*
Medicine and Veterinary Medicine									
Medicine	60	1	1	1	0	22	0	12	23
Veterinary Medicine	28	1	0	0	0	8	0	2	17
Sub-total	*88*	*2*	*1*	*1*	*0*	*30*	*0*	*14*	*40*
Science & Engineering	*395*	8	16	6	10	66	10	54	225
Total	**1269**	**29**	**53**	**28**	**35**	**271**	**28**	**168**	**657**

Table to show spread of disability across the University of Edinburgh, 2003

The table was compiled using the UCAS categories
V I: visual impairment
H I: hearing impairment
Mo: mobility difficulties
M H.: mental health problems
U/S: unseen difficulties
Mult:multiple difficulties
Other: conditions not covered by the above

Clearly, Dyslexia Advisors on their own cannot carry the full responsibility for supporting students with dyslexia: responsibility must also be carried other support staff. Thus, library staff, having been attuned to the needs of students with dyslexia, can offer support by extending loan periods, helping with information retrieval and the utilisation of academic databases; counselling staff can help students to cope with the additional stresses and anxieties they encounter in their studies, as well as helping them to come to terms with the fact that they have been diagnosed as dyslexic. The careers service can provide specific support with regard to choice of vocation, assistance with applications and preparation for interview.

However, a substantial part of the support for students with dyslexia must come form academic staff themselves. Academic staff are bound to develop a close relationship with their students and the central responsibility they carry is to shape the learning undertaken by students. Of course, as academic specialists, such staff may not necessarily be expert in providing support for students with dyslexia. One of the central functions of the Dyslexia Advisors is to ensure that academic staff are able to incorporate into their teaching and learning strategies explicit forms of support for students with dyslexia. Thus, teaching staff are encouraged to support students with dyslexia in lectures by:

- starting each lecture by giving an overview of the topic
- limiting the amount of text; concentrate on key points
- stating intended structure of the lecture
- providing skeleton notes with lecture headings
- pausing and summing up frequently
- giving out plan and reading for next lecture in advance
- making set times to see the students who may be confused over simple points while understanding more complex issues.

Curriculum support in coursework may include:

- making sure instructions are clear
- introducing practical tasks in place of theoretical
- making samples of written work available
- allowing more time for reading
- giving focussed reading lists
- helping with the analysis of questions and the planning of essays
- offering to check notes
- encouraging the use of non-linear note-taking
- offering audio-visual sources on subject matter, for example, videos.

Advice on marking of the work of dyslexic students is also offered:

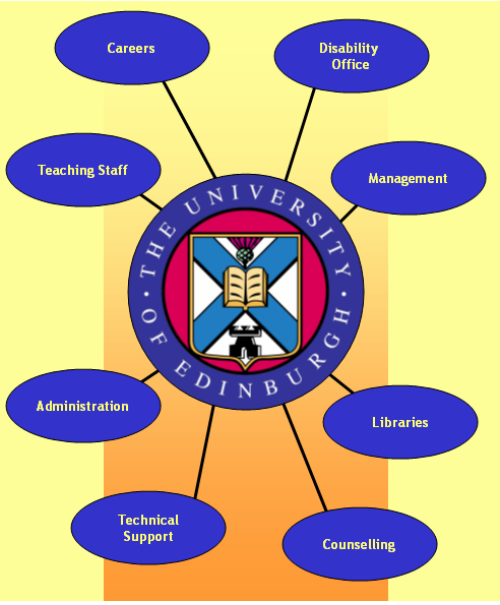
- give opportunities for self-assessment
- look beyond the literacy deficit
- identify positive features, for example, original ideas, good use of argument
- provide feedback that is appropriate and relevant.

There are two additional groups of staff who have key contributions to make in the support of students with dyslexia. Firstly, there is technology support staff who, as both hardware and software become an essential part of dyslexia support, play an increasingly important role by:

- specifying appropriate equipment that corresponds with the whole-university technology
- helping with ordering and installation
- advising on up-to-date software
- setting up computers for use in examinations
- introducing students to dyslexia-friendly software.

Secondly, there are Directors of Studies. At the University of Edinburgh every student has a Director of Studies, who is responsible for exercising general pastoral and academic oversight of a group of students. The Director of Studies meets periodically with students to assess progress and to address any difficulties that may impede students' progress. The Director of Studies acts as a bridge between academic departments and specialist support services, including the Disability Office and the Dyslexia Advisors. For example, in the course of a planned or informal meeting with a student the Director of Studies may sense that there are difficulties relating to the processing of information obtained from lectures and may advise a meeting with a dyslexia advisor to explore what support could be put in place.

Institution-wide provision



It can be seen that the arrangements for identifying and supporting students with dyslexia depend for their success on a number of factors. Firstly, formal procedures are established for the identification of students with dyslexia and institution-wide arrangements are in place for insuring consistent levels of support wherever it is needed. Secondly, through staff development and in other ways dyslexia advisors are able to ensure that academic staff are alerted to indicators of dyslexia and to the ways in which they can adjust their teaching, as well as their forms of assessment, to ensure that students with dyslexia are able to demonstrate their full potential. Thirdly, the institution's quality assurance arrangements provide a check that at departmental level appropriate systems of support are in operation.

Finally, the effectiveness of the arrangements depends crucially on the availability of resources. These come in two forms. Firstly, the University receives funds from the Scottish Higher Education Funding Council to staff a

central university service which carries front-line responsibility for identifying and supporting students with dyslexia. Secondly, and perhaps more importantly, students who are formally assessed as dyslexic have an entitlement to additional financial support. That takes the form of the Disabled Students' Allowance (DSA), which is a benefit that is distributed by central government whenever the need for that form of support has been demonstrated. The DSA offers support to dyslexic students in two ways: firstly, in offering funding to allow the student to purchase equipment, for example, a computer programmed with supportive software to enable them to submit accurate written language or a digital recorder to allow them to record lectures and therefore access relevant information.

With regard to compliance with the DDA in the field of dyslexia, the university acknowledges the anticipatory duty to make adequate provision for students with dyslexia. Moreover, its procedures for student support and its teaching and learning strategies demonstrate a commitment to making all reasonable adjustments to ensure that students with dyslexia are not disadvantaged in their studies because of their disability.

8. Matching technology to needs

Bodil Andersson and EA Draffan

Precisely matching the skills and abilities of computer users who have specific learning difficulties, dyslexia or other disabilities with technologies that offer extra support and assistance is almost impossible. The idea that one can make a perfect match for every task based environment is also hard to achieve. We tend to buy reading glasses with the hope that they will improve our ability to read in all situations. But as we know they will only help if they are correctly chosen for a particular visual acuity problem and are used appropriately, for instance reading text on paper rather than the television. The matching has to occur at all levels, as do the skills for not only coping with the tasks involved, in this case viewing text, but also for using the assistive technology. It would appear easy to use a pair of glasses unless you are unable to put them on which may be a dexterity issue rather than a visual one. There is often the expectation that one size will fit all so perhaps a more suitable question to ask is… How do you match the mixed difficulties that some people encounter in diverse situations with the many assistive technologies on offer? Not only do you need to take into account the complexities of the devices, software and hardware but also the diversity of human abilities (cognitive, physical and sensory) as well as their learning preferences in various situations.

Historically assistive technology has been categorised to fall in line with the categories used for disability. However, it is felt that this is a rather simplistic method for making matching technology with needs, as it does not take into account comorbidity, where a person may have a combination of difficulties that impact on their learning skills such as dyslexia and attention deficit disorder. The general categories do not highlight individual strengths and weaknesses or coping strategies that have been developed over time and these issues rarely fit into neat groupings. Furthermore, many technologies now used by dyslexic students were not originally designed for their specific learning difficulties but have been adapted.

Technologies adapted for use by those with specific learning difficulties and dyslexia.

Speech Synthesis

Screen reading was originally designed for those with visual difficulties with the system reading out all the menus, navigational pointers and text on a page. This type of auditory output can be very tiring when it is too verbose and blind users need to have very good auditory perceptual and memory skills. These two abilities may not be readily available to those with dyslexia and yet it is often supposed that this type of support will help those who find reading from the screen difficult. Long strings of spoken text will not suit those with auditory perceptual and working memory difficulties. However, by allowing

the user more control over the speech the dyslexic user may be able to cope – so text to speech with the facility to choose where and when the voice should be speaking may be more helpful and it can be synchronised with text highlighting. The latter can also help someone with visual perceptual difficulties to pin point words as they are being read. The computer and software needs to be successfully controlled by the user. The changes to screen reading that have occurred over the last few years have mainly been in this direction with the ability to add pauses between words, listen to the different inflections when good punctuation is used as well as choose from a much wider variety of voices has proved beneficial. The increased accuracy of highlighting with various colour options has also been helpful.

Text to speech when set up correctly can help to increase reading speeds and help comprehension and concentration. It can be used for proof reading a user's work and highlight errors, although this aspect requires good auditory skills both from the perceptual point of view, as already noted and also discrimination – recognising the difference between 'choose' and 'shoes' for instance or noticing homophones and having them checked for meaning 'choose' and 'chews'.

Word Prediction

Over the years several word prediction software packages have been developed, as a way of reducing the number of keystrokes used when writing on a computer, to assist those with mobility, dexterity and communication difficulties. More recently word prediction programs have also been developed for those with specific learning difficulties and dyslexia. They provide a method of support for encouraging the use of good vocabulary and speeding up text creation. If someone has typing speeds of around 8-10 words per minute then word prediction will help by increasing text output, but if speeds are around 25 or more words per minute ((Koester, 2002) then it may be the vocabulary support that is the main advantage. This aspect only helps the dyslexic student if the list of word suggestions is not too long as visual perceptual difficulties as well as short term memory issues may arise when coping with long lists of words that appear on a scrolling screen. It is important for the correctly suggested word to appear in the top 3-5 words (Montgomery et al, 2001) for most users and it helps some to have text to speech to assist reading. The ability to reduce the number of words in the list may help and the fact that the list tracks the typist means that the eye does not have to jump to different parts of the screen.

Speech Recognition

Talking into the computer to produce text has long been the dream of many dyslexic students, thinking that this would solve all their written language difficulties. But the programs were designed for business users with complex and lengthy training scripts and later used to help those with mobility and dexterity difficulties who required extensive voice command systems with a

grid for navigation as well as speech recognition, where the sounds are transcribed into text. The computers often did not have sufficient power or random access memory to work seamlessly with text input let alone to read the text during the training which has since been developed to help those with dyslexia. With modern computers this is no longer a concern and recognition rates have improved enormously. Now it is the ability of the user to dictate in a continuous stream with punctuation and accurate sentence construction that may be an issue. The programs will read back what has been written as well and allow the user to hear a recorded version of their original dictation. These last two features can help the dyslexic user go over their transcription to check for mistakes. So why is this technology not used by all? The programs do not make spelling errors so this should help and they can be used with homophone checkers as well as CD or on-line dictionaries. But it is not always easy to spot the malapropisms or sentences produced with minor changes that alter the meaning completely but are not picked up in computer based proofreading. This means that the errors may not picked up until the assignment is handed into the tutor or the student spends many hours knowing there are errors but not being sure how they can be corrected because their understanding of syntax and semantics is weak. Along with these difficulties there has to be an element of multitasking or simultaneous processing – dictating, reading on the screen whilst mentally thinking about the content, this can be challenging and typing may prove the easier option.

Users often state that they are used to writing and thinking or typing and thinking. Being able to work with written and spoken language at the same time is a complex process. The language used in conversation and discussion is very different compared to written text. A writer can only emphasize items of importance through punctuation, underlining and the strength of a word… elements in composition that do not come easily to most dyslexic students. A speaker can add vocal inflexion, facial expression, gestures and bodily actions, features that, unless a student has social communication difficulties, are generally seen as a natural part of imparting information orally.

In writing, repetition is avoided although this can cause problems for those with dyslexia who often forget what they have written and repeat an idea or sentence without realising. However, certain phrases or constructions repeated in conversation can help the listener to follow the speaker's main thoughts and are readily accepted as part of the process - a reader can re-read something; a listener only has one chance. In speeches repetition can be used as a persuasive force, for example, Churchill "we shall fight on the beaches, we shall fight on the landing grounds, we shall fight in the fields….". In writing it has to be the precise nature of the vocabulary used that sways an argument. The reader needs to be able to 'picture' the situation and understand the environment.

Finally in conversation the user may speak in a relaxed manner with many shortened terms and a casual use of language. Both the content and the manner of speaking can affect the recognition rates and practise is necessary. When training speech recognition systems, the user reads the text to help the program learn the user speech patterns. Reading is very different from freely dictated speech and it pays to import samples of a user's previously written articles or essays to improve the voice file. It may also help to have an outline and a few notes related to the subject on hand before the dictation begins.

Articulation should be relatively stable as sounds that are constantly changing do not lead to the success rates achieved with clear even speech and accurate word endings. Finally it is important to realise that the machine may not always be right despite a user's best efforts and that there is a tendency for the dyslexic student to blame him or herself and for their confidence to plummet yet again when in fact the result had nothing to do with their expertise… "Descartes articulated a philosophy of nature based on the idea of the machine" ….might come out as "Day carts art IQ-dated a Phil O. Sophie of Nate Schurr based on the ID of the mash sheen." (Cantor, A 2001)

Spell-checkers

Spell checkers were originally designed for computer users who made typing errors and the odd spelling mistake rather than as a feature in a word processing package to increase spelling accuracy and help with proof reading. Rarely have the spell checkers been tested for their efficiency when coping with the specific types of visual or phonetic errors made by dyslexic users, although in a recent study Microsoft Word coped with around 74% of the basic errors made within a large collection of spelling mistakes (James and Draffan 2004). However, there are several specialist spell checkers with text to speech and phonetically mapped word lists now available. What has not been taken into account by assessors and software providers is the fact that some dyslexic students may be able cope with long lists of alternative spellings, when there are no visual discrimination difficulties, whilst others need to have every suggestion read out as they are unable to see the differences between the words.

The spell checkers provided can cause problems and frustrations unless they have been adapted to suit a user's needs – shortened lists, adapted dictionaries and text to speech letter by letter or word by word etc. These facilities are often available in a single program but there appears to be no differentiation when training is provided. There also needs to be an appreciation for the differences that the standard of the vocabularies available can make for individual students, so a program with a smaller dictionary and a restricted number of words showing as suggestions, may suit those taking general subjects at a lower level compared to a graduate with complex vocabulary needs who may require a specialist dictionary with a spell checker that copes with more bizarre errors by offering more choices. It should also

be noted that several programs can be set up to learn from the user's errors and improve their rate of correct suggestions appearing at the top of the lists offered.

Generating Ideas in a graphical format.

The concept of putting ideas on paper in a pictorial way has been developed into what was called by Tony Buzan 'mind mapping'. Ideas are presented on tree like branches that take the main thought from the centre to ever decreasing levels with text or pictorial representations of other ideas. This process has been computerised into a series of different programs that either maintain the look of text on a line or branch or those programs that invite the user to have series of concepts in boxes or symbols. The web diagram or spider diagram that results can be viewed in linear format and exported to other programs. Once again this system was developed for generating ideas in a business setting and taken on by educational software companies when it was appreciated that many students enjoy thinking in pictures or seeing ideas holistically rather than in lists. The thought of having to make an instant hierarchy or set of priorities can stultify those who like to generate ideas as they come into the mind without sorting or with any preconceived order. Others find this a messy approach and prefer a clear order at the outset.

Anderson-Inman et al (1993) have highlighted the gains of being able to change the format and flow of ideas at any time and the tidy result of a computer based mind map with its easy exporting facilities to other programs or paper. However, Helen Ball, in a final year project at Sussex University, discovered that there were no significant differences between a paper based exercise and a computer mind map when it came to accurately recalling the data after a break. Some people say that they remember better when they have drawn the ideas but this phenomenon did not appear to occur in this small study. So once again it is down to user preference and it helps for a student to learn where his or her strengths are for revision purposes. Does it aid the memory to have facts or ideas as part of a group in a web like structure with colour and icons etc or is it more important to have a clear well ordered list with text based links to each idea. Is having the text read back important and being able to audio record ideas easily helpful? By asking questions like these and knowing the programs available, a better match can be made with the technologies for the setting required.

Conclusion

There are many other programs that could be discussed in this chapter on matching the technologies and user within the diversity of learning and task based environments but the important goal throughout is to allow the user to gain independence. They may need tools to compensate for their difficulties with written language, reading, spelling and organisational tasks but with the

right support they can gain confidence and determination with a willingness to try tasks that would have been daunting without the correctly chosen assistive technology. As has been said it is important to look not only at the obvious skills but also to assess the underlying written and spoken language abilities.

It seems there still needs to be more research undertaken related to the particular and varied needs of computer users who are dyslexic. There needs to be further development of more compensatory software based on the specific requirements of users with complex underlying written language difficulties and finally there needs to be a chance for more people to have the opportunity to use already available assistive technologies appropriately adapted to suit their needs.

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9. Dyslexia and E-learning – a guide to good practice

Ian Smythe and EA Draffan

With the increased in e-learning widely available, greater attention is being focused on the ability of the end user to be able to learn effectively. The diversity of materials now in the marketplace range from stand alone CDs through to online courses where one studies alone and the lecture notes which are subsequently put on the web. Although some e-learning developers are aware of the issues involved, many of those who are responsible for developing course materials which will be used by dyslexic students do not appreciate all the components that should be considered. This chapter provides a brief, but not exhaustive, overview of the issues one should consider when preparing materials for dyslexic students.

E-learning has been defined by the EU as “the use of new multimedia technologies and the internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration.” Thus it encompasses, for example, multimedia CDs and the internet, but is also impacted upon the use by assistive technology by disabled students. Dyslexic students often make use of text to speech software when reading from the computer and digital recorders when listening to instructions or wishing to make private memos when working through on-line materials. However, whilst there have been a number of initiatives with respect to usability related to distance learning and the use of screen readers for those with visual impairments, there has been little consideration to the needs of the dyslexic individual, with the exception of the Dyslexia Web Access Guidelines (Grainger P, 2003: see the chapter in this book). As a result, this chapter sets out a framework for understanding and evaluating the e-learning with particular emphasis on the needs of the dyslexic individual. The guidelines are not specific to any one country, or with respect to any specific legislation. They are based on sound principles that reflect the essential requirements of open access for all as outlined in various EU directives and national legislation across Europe.

The starting point is to clarity what we mean by the terms we have chosen to use when designing the framework, and what that encompasses. Note that these are not intended to stifle innovation and creativity, but to overcome the lack of appreciation that the ability of e-learning to deliver learning outcomes is not dependent on appearance, bright colours and animation, but can only be evaluated by the client’s success.

The key areas identified (Smythe and Draffan, 2004) are:

- Accessibility
- Usability
- Readability
- Learnability

Human interface

Each of these will be discussed below, with examples. Note that they are treated separately, but are obviously highly interrelated.

Accessibility

The accessibility of material usually refers to whether or not one can acquire information from a module or learning object. The term is not just computer based although there is a tendency to use it in this way. It does not carry any criteria as to how easy it may be to access the learning object or whether the person needs a certain amount of knowledge of how to use appropriate assistive technologies that may be required to access the materials if the student has a certain type of disability such as a visual impairment requiring the use of magnification.

Case study

There is an increasing trend towards development of websites using Macromedia Flash, which provides opportunity for total management and control of the medium, without the restrictions imposed by the browser. However, until Flash MX (circa 2002) the content of these files could not be accessed using screenreaders, since the text appeared as graphics. The more recent versions of Flash allow the supporting text to be embedded in the file, and read by some, but not all, screenreaders. However, many developers of e-learning, e.g. UfI (University for Industry, UK) would find it very time consuming to update the old material and include readable files, making much of their content inaccessible to the blind, partially sighted, and those with reading difficulties (e.g. dyslexic individuals) who wish to use screen readers.

Scope

Accessibility should be considered as the ability for the individual to acquire information from the page, and any learning module that is hard to access will soon cause frustration and be a disincentive to the acquisition of new knowledge. As far as possible, the material should be made accessible regardless of location, type of computer technology or experience to a wide audience and not just the dyslexic individual. Thus the deaf dyslexic individual and the blind dyslexic individual can join colleagues in the process gaining similar learning experiences.

Principles of good practice

There are a number of principles of good practice that should be remembered when ensuring accessibility.

1) Ensure the content can be accessed by all the major assistive technologies. Where appropriate, check it with the software specifically used by the client group.
2) Work with the client group, and develop an evaluation system whereby the client group can provide constructive criticism.

Usability

The content of a website may be accessible (i.e. you can get to it) but it is difficult to do so, for technical reasons, or for "comfort" reasons. This is where usability comes in. If learning content is not situated in user-friendly surroundings the quality of the learning experience will not be optimal. Usability can be linked to the ease and speed of learning which will be mentioned under 'learnability', as well as how memorable a journey through a set of materials has been for a student. Usability can be formally measured through, for instance, navigational errors, their frequency and severity but it is largely a subjective satisfaction rating that has an impact on the user.

Case Study

An example is the website of the British Dyslexia Association (BDA), who suggest that the best colour for a background for the dyslexic individual is cream, and this is the colour adopted by the BDA for their website. However, what little research there has been in this area suggests that the colour of preference is highly personal, and that cream may be the preference of no more than 40% of the population. Other websites allow the user to determine the page and text colours.

Scope

Areas to consider in Usability include:

- Typeface (Times, Arial or Comic Sans are the most popular)
- Font size
- Leading (line spacing) and justification
- Text and background colour
- Background colour
- Content layout and navigation, including 'intuitive' use
- Scrolling or paged content
- Heading
- Use of "white" space

Typeface

Times, Arial and *Comic Sans* are the most popular typefaces. As far as possible, the computer system used by dyslexic individuals should offers a minimum of three choices – most offer many more, and this can also be confusing to the user. In the past it has been suggested that Times is the best for the dyslexic individual since the eye is led from one letter to the next. More recently there has been a trend towards more widespread use of a 'sans serif' font such as Arial (or Helvetica on the Apple Mac). However, research suggests that whatever you used last would tend to suggest what you will prefer next. The recent preference for these sans serif fonts is probably led by the use of computers. On a computer screen, the small detail of a font like Times, with its "curl feet", may be lost. With Arial and Comic Sans, both of which come with the Windows platform (and are therefore widely available)

the variation in sizing and individual character spacing can be achieved with ease. Other fonts to consider are Sassoon and the one developed specially for the RNIB (Tiresias) for clarity on screen with enlargement.

Font size
With paper documents, it is possible to specify exactly the size of the text. This may also be true for some web pages by using the browser option to make changes to the text size, overcoming the designer/commissioner (with good young eyes!) using a type size that is too small for most people to read, with the option for the browser to modify being disabled (e.g. by using Flash). The size the text should be will depend on other factors, such as screen resolution. Thus a letter that appear 5mm high on 800x600 screen will be 3mm high on a 1400x1050 screen. Background colours also have a subjective impact on font size for some users, so bright yellow lettering on royal blue will appear more intense and easier to read compared to pale blue on dark blue even if the font size is actually smaller.

Leading (line spacing) and justification
Most designers use the default settings for line spacing (20%, that is, when a 20pt font is used, the line spacing will be 24pt). However, many dyslexics find a greater spacing (eg 30%) is preferable. But if the spacing is too great, the ease of reading will decrease.

As a rule, text should be left justified with a chance for the dyslexic user to see a jagged pattern down the right side which can help the location of areas that need to be reread when returning to a page. If the entire right side looks similar there are no easy markers. Variable word spacing which is the result of totally justified text can also be very confusing.

Text and background colour
A number of websites offer the ability to changes the background colour of the website (e.g. www.dyslexic.com). With cascading style sheets (CSS) it is possible to create dynamically modifiable text and background colours (as well as font size). This allows the user to specify the way they view the content. However, in acknowledging the range of colours possible, and the time it may take to find the best combination, the choices have been limited. An approach currently under investigation by the Welsh Dyslexia Project Dystrain project involves a brief interactive website that identifies responses to preset combinations from which it attempts to provide the best combination.

If the colour combinations are fixed, it is important to remember that there are many individuals who have difficulties with colour, and these difficulties may be even greater than the considerations with respect to dyslexia. For example approximately 5-8% of the male population (and 0.5% of female) have a form of colour blindness with the perception of red or green being affected. http://www.vischeck.com/vischeck/vischeckURL.php provides a method to

check the “viewability” of a website for various colour blindness difficulties. (NB It does not work on all websites.)

Content layout and navigation

Layout is an import and frequently overlooked component. Consider a scenario where you have on a single screen 62 clickable zones, including the browser itself. Not only is this very confusing to the individual, but it also leaves little space for the learning zone. Text and picture placement is important, as is the ability to return to where you came from. Clarity and simplicity should be more important than “designer” looks. Consistency is also important when moving from one section, module or learning object is important.

The layout and navigation should be intuitive and provide the familiarity of face to face learning with the ease of communication that one is used to in class. For some the latter may not be that easy and therefore e-learning offers great advantages. It is also about feeling secure in the knowledge that the content will be consistent, simple to use and having once learnt how to work with one module the rest of the learning content will be similar. This means that generalisation can take place and key learning skills can be used in a wider sense.

Scrolling or paged content

Due consideration should be given to providing information on a page by page basis, like in a book, or through scrolling, which may be more difficult for those with coordination problems. Alternative navigation for scrolling should be considered, such as dragable scroll bars, arrows, and key depressions. At all times horizontal scrolling should be avoided as this affects text scanning and on the whole it has been found that the ideal line length is around 60-80 characters although people tend to be able to read faster when there are only 30 -50 characters as in newspaper columns. But columns are not helpful on a web page as they require the user to scroll up and down on one screen so most good learning content developers have a short section of text that takes up the middle or right side of the screen.

Quirks

There area a number of quirks and idiosyncrasies that one should be aware of when developing on-line learning materials for the dyslexic individual. For example, text-to-speech readers do not like headers. If there is no full-stop at the end of a heading, the software will continue into the next sentence. To overcome this, many designers add a full stop at the end of a bullet point, statement phrase or header. By making the punctuation mark very small (i.e. a lot less than the size of the header font), the visual effect is minimal.

If tables are used, the content needs to be designed to that it can be read across the columns from cell to cell, left to right, as this is the default mode for most reading software packages.

Many readers prefer to set up their browsers with text enlarged and this can affect the way menus are seen with part of the headings disappearing into neighbouring frames or disappearing down a narrow column so that the user is constantly scrolling up and down. It is also important to realise that dialog boxes and other pop-up text boxes may not respond to basic text enlargement which can cause problems for readers.

Principles
Keep it clear and clean, ensure navigation is easy, provide options on as many of the parameters as possible, and welcome user group feedback.

Readability
Whilst many e-learning content managers and web site developers do pay due care and attention to the issues of accessibility and usability, fail to consider the ease with which the user group can read the content provided. In a recent survey of academic sites at UK Higher Education level it was found that all were accessible but the reading levels were at around postgraduate level.

It is important that the text is age, culture and content appropriate. In a face to face situation it is much easier to choose appropriate text for the ability of the individual as they may be known personally. The material can be changed when it is perceived that the student is failing. However, computer based learning tends to assume that all learners progress in a similar way, though at different speeds. However, too frequently prose is provided before the individual is ready for it. If the individual does not have the skills, particularly vocabulary skills, this presents a problem for understanding the text. Computer programs usually make decisions based on the average student. And by definition, the special educational needs student is not average.

For example, there are many “virtual” courses aimed at those who did not attend university. Many of those may be dyslexic. However, the reading level required is still at university level, rather than a level commensurate with course content. That is, the learner may be denied access to the course because their reading skills, or disability, is being tested rather than the ability to learn the content. And this is before they get to the examinations.

The readability of a given text can be evaluated using a number of simple instruments (eg the FOG, SMOG and Flesch-Kincaid Indexes), most of which rely on measuring:

The average number of words in a sentence

The number of multisyllable (or say more than 6-character) words
Average number of syllables per word

There are a number of websites that offer statistics on “readability”. One of the most comprehensive is to be found at http://www.readability.info/

Ensuring readability

- Make the average sentence length 15 to 20 words.
- Be concise.
- Use bullet points wherever possible.
- Use simple, but not patronizing, vocabulary.
- Use the active voice rather than the passive.
- Introduce new ideas when others are consolidated.
- Avoid cross-references wherever possible.
- Use illustrations to help provide clear meaning.
- Obtain feedback from the user group.

Other web sites that offer guidance on writing include the following:
http://www.useit.com/papers/webwriting/
http://www.askoxford.com/betterwriting/plainenglish/
http://www.blm.gov/nhp/NPR/pe_toc.html
http://www.e-gineer.com/articles/web-writing-for-many-interest-levels.phtml
http://www.webstyleguide.com/

For plain language guides, you may wish to consult:
http://www.plainlanguage.gov/library/smpl1.htm

Learnability

It is interesting to note that the introduction of computers into mainstream education has provided the potential for a new level of analysis in education that was rarely seen in traditional teaching. However, many of these ideas are still very new, and have not been integrated into all areas of computer based learning. As a consequence, language learning is still little more than books with a multimedia component, despite claims to the contrary.

Modules need to offer structured sequential learning, with a logical progression tailored to individual needs, particularly for the Special Educational Needs (SEN) individual. For example, just because others learn by an “immersion” principle does not mean everybody should. Many dyslexics prefer to be taught grammar and syntax explicitly as they have trouble acquiring the rules implicitly. Few programs provide an opportunity to switch between pedagogic approached, and when the approach does change, it is only a sequential change, not a response to failing to learn by another approach. This is very important for those SEN individuals learning languages.

There should be a framework based on well established pedagogic e-learning principles. Issues to address with respect to the dyslexic learner include:
1) the structure of the material to maximise learning
2) the effective sequencing to maximise scaffolding and other principles
3) the principles of “rewards and punishments”
4) the role of collaborative learning
5) the ability to learn by active (and passive) discovery
6) the individuals predisposition towards e-learning
7) the necessity for personalisation of tasks and activities
8) the process of reinforcement through over-learning, self-checks, evaluation and assessment
9) level of learning support (i.e. the relationship between the learner, the medium of learning, the content and the tutor).

Careful consideration should be given to the active process whereby learners are encouraged to construct new ideas or concepts based upon their knowledge (constructivist theory). Some of the areas discussed above (e.g. learner centred activities) may be disempowering for some dyslexics due to the nature of their difficulties.

Human components
The SEN individual frequently needs additional support, including emotional and motivational support, particularly when the software is not user friendly.

The term ‘blended-learning’ has come into use as learning environments have included more communication elements along with face to face meetings. It has long since been realised that students learn best when e-learning is mixed with more traditional approaches and this is particularly true for dyslexic students. The chance to share thoughts with others in a classroom or tutorial situation should never be underestimated. For the articulate dyslexic student who still finds the keyboard or speech recognition software a barrier this is essential.

10. A conceptual model of ICT needs of the dyslexic student

Ian Smythe, Paul Blenkhorn, Gareth Evans, Linda Siegel and EA Draffan

In this chapter we shall attempt to build a model for the development of software for the dyslexic student, irrespective of the language, but looking at the literacy and life skills needs of the dyslexic individual at university. It is hoped that this will form a basic guide to the development of assistive technology in different countries.

A model of literacy skills

There are many models of literacy skills development, but the one used here highlight the needs of the dyslexic student at university. This is not intended to be exhaustive, but provides a starting point particularly for those where there are no resources currently.

The following table shows how software maps onto the main areas of literacy needs of the dyslexic student.

Literacy skill	Literacy component	Software
Receptive language	Reading single word	*Text-to-speech*
	Reading comprehension	*Text-to-speech*
	Listening comprehension	*Digital or tape recorder*
		Concept mapping
Productive language	Expressing ideas	*Concept mapping*
	Writing ideas	*Speech-to-text*
		Predictive software
	Productive validation	*Spellcheckers*
		Grammar checkers
Life skills	Keyboard skills	*Typing tutors*
Sensory preferences	Visual	*Magnifiers*
		Fonts and colours

Receptive language

A student will be “receiving” large amount of information through the spoken word and throughout their course as text. This will be in the verbal form of the spoken lectures and tutorials, or written form through books, handouts and electronic information.

For the speech based knowledge, the problem is usually one of memory and transcribing to the paper or computer at speed. Two main pieces of software are available to help. Firstly there is sound recording, which provides an opportunity to time shift, rewind, and save the information. Some students use concept mapping during the lecture. This requires considerable skills in summarising the spoken word into a few words to be written down.

For reception of the written language, the principle tool is the text-to-speech software. There are a number of technical solutions to this, all of which involve turning an orthographic representation into a verbal format. The student may use this at the single word level, or with continuous blocks of text, having control over the voice, speed and pitch. Variants include the ability to provide an orthographic based look-up ("definition" or "thesaurus") version, a semantic version which may provide visual stimulus (i.e. a photograph or illustration), a translation, or a verbal response (e.g. a dictionary or translation of the highlighted text). Additionally some text-to-speech software saves the output in a format whereby it can be listened to at a later date.

The main technical consideration for development of text-to-speech is the availability of a "voice" that will power the engine. Many "voices" have been developed particularly for the blind community. However, a number of countries, especially in eastern Europe, do not currently have access to suitable "voices". There are two ways this may be address. 1) develop a voice specifically for the language. However, this is very expensive. 2) Use a word by word look-up system. This would call upon a phonological representation that corresponds to each orthographic representation that may be encountered. Although this may solve the lack of a voice in the short term, by having a native speaker read all the potential single words to create a phonological dictionary, the lack of tone and intonation means it is only really advisable for use with single words.

It should be noted that across Europe, many universities still insist on tests of English proficiency as being one of the prerequisites of university entrance. This is due to the large number of technical books, journal and internet information resources that discuss the latest international research only being available in the English language. Many dyslexic students would benefit from having access to text-to-speech technology that helps with English, as well as their own language. There are a number of examples of this available free on the internet.

Productive language

Productive language refers to the development of ideas, and communication from the initial thoughts to the printed format to express and share ideas. Many dyslexic individuals have difficulty transferring their thoughts from rough ideas to a linear format required in essays. Concept mapping software (sometime referred to as mind mapping) can provide a useful tool to

brainstorm ideas and provide a focal point from which essays can be developed. They allow all the ideas to be mapped out, and the relationships between ideas to be established. However, it is important to note that some level of structuring skill is required both at the stage of development of the concept map, and in turning it into a linear format. Whilst most programs allow the output to be sent to a word processor, it is still the student who has to decide, for example, the order of the paragraphs. Furthermore, there are a number of different programs which allow alternative approaches to concept mapping. Only by trying them all for enough time to become proficient is it possible to know which is best for you.

Many dyslexics have problems with the physical writing process. This may be assisted by use of speech-to-text software, whereby the spoken word is converted to a written form. Unfortunately, the technical hurdles to develop a version in a new language are too considerable to be discussed here. However, it should be noted that many individuals who speak a language other than the language of tuition are able to use speech-to-text software designed for the language of tuition. (e.g. a Romanian speaker could use an “English” speech-to-text software if they wanted to write in English.) The more divergent the users voice is from the built in training patterns, the more training will be required, but it is possible. Thus some multilingual dyslexics are able to flourish in a language environment which is not their mother tongue by using such technology.

Predictive software attempts to suggest what word to use next, providing shortcuts to make choices. The probabilistic algorithms provide a reasonable level of prediction, but there are doubts about the overall usefulness of this compared to the other software such as spelling and grammar checkers. Therefore this is not considered a priority in the development of software to support the dyslexic student.

It is important to “validate” the product. That is, to ensure it says what the producer thinks they said. Unfortunately, the only tools available are spelling and grammar checkers. There are no tools to help the individual to know if the meaning corresponds to what they think it should say. Put another way, software cannot say if the paragraph order is logical, or if it makes sentences make sense. The usefulness of the spellchecker will be dependent upon the algorithms used, including the extent to which correct spellings occur high up in the list of possible alternative, the ability to find the right word even when the spelling is far from the target word, and the way in which homophones are handled. That is, the useful of the spellchecker will be dependent upon the ability to easily find the correct word from alternatives offered.

Some grammar checking capability is built into most commercial word processing packages, though the quality is generally not good. However, few students are taught how to access and use this tool effectively. Time would be

best invested in showing students how to use the existing tools rather than develop new ones.

Life skills
One of the most useful “life skill” tools with respect to ICT for dyslexics at university is the typing tutor. The teaching of automated typing skills should be an important priority for those who wish to use ICT as a dyslexia support tool. Not only is it important to be able to type fast, but also the typing process helps to reinforce and improve spelling. However, few programs use a system which builds upon the orthographic principles of the language. Most are repetitious, and only provide an ability to hit the keys quickly. They miss the opportunity to teach through the orthography, and thereby to spell automatically.

Sensory preferences
It has been suggested that the dyslexic individual is less tolerant to parameters outside their preferences for background colour, font colour, shape and size compared to the non-dyslexic individual. That is, the dyslexic individual has greater difficulties if the information is not displayed using their optimum preferences. The principal software programs in this class include screen magnifiers which increase type and picture size. Some programs also grey out areas not being accessed, thereby providing a smaller area on which to focus. This helps concentration and tracking, both important issues with the dyslexic student. Software is also available to set system and software colours and fonts globally. This saves having to set the preferences in each and every piece of software.

Other software and hardware
There are a number of other items which may be used by the dyslexic student at university. These include scanners which may assist the student creating electronically accessible versions of printed material (e.g. for use with text-to-speech), voice output control (volume, pitch and speed), alternative input tools (e.g. keyboard input rather than mouse input), software to adjust intra-letter and intra-word spacing etc.

Conclusions
The table above highlights the software which would provide most dyslexics with most of their needs. Some already exist in many of the languages of Europe (e.g. text-to-speech). Some are will be easy to adapt to other languages (e.g. concept mapping). And some need considerable resources to develop a product that will be usable for the dyslexic individual (e.g. speech-to-text). Each country will need to set its own priorities as to software development. But much could be gained by making effective use of what is already available, adapting it to the needs of the dyslexic student, and ensuring the dyslexic student is able to use it effectively.

11. ICT and examinations at university

EA Draffan, Ian Smythe and Georgiana Ghitulete

The purpose of this chapter is to address one specific issue that confronts many dyslexic individual, the use of ICT in examinations. Rather than attempt to address all the issues surrounding ICT in an area that is difficult to quantify, this chapter involves a survey of the approaches used in different countries, and some case studies to highlight alternative approaches.

Much of this report looks at the use and availability of ICT for the dyslexic student throughout their university study. However, there is one crucial time for the dyslexic student – the examinations. The issue to address here was how to evaluate the individual rather than the disability, and more importantly for this project, how the technology can be used fairly.

The disability perspective

As can be seen from previous chapters, each country has its own perspective on disabilities, and how to interpret that. Furthermore, each institution will interpret the rules differently. For example, although the UK has discrimination legislation with respect to universities which implicitly includes the support of the dyslexic pupil, there is considerable difference between institutions as to what can, or cannot, be used in an exam.

Consider for example the spellchecker. These are extremely useful tools and most dyslexics will use them extensively for their coursework. Many will adapt the spellcheckers to their own specific needs, including the correction of their common errors. When it comes to the examinations, most institutions will allow the use of spellcheckers, but many prohibit the use of a customised spellchecker. In other words the disability provision they have been using up to the examinations is take away specifically for the exams, often the time they need it most!

The survey

Below is a brief survey with results from those who responded. Although it is difficult to quantify given institutional variation in any country, it is possible to see that there is differing provision.

Country - Austria

What % of course marks depend on the final exam? (Typically)

This question is not suitable for the Austrian system. A final exam can be at the end of a course (there are various ways a final exam can be marked and a percentage cannot be given). The various departments and even subjects within the departments may have their own rules how to end up with a final mark for a student. There is a final exam for a baccelaureat (This type of study has just been introduced and there are also various types of final exams depending on the type of study.) There is a final exam for "Magister", which

comes after the baccelaureat. Your thesis must be positive in order to be able to do the big oral final exam (there the final exam depends on a successful thesis). There is another big final exam for a PhD (you need to write a doctoral thesis and do an oral exam). For "Magister" and PhD you pass the final oral exam or you fail and have to repeat. For courses it depends on the type of course - students´ marks depend to a higher or less degree on the final exam. For major exams, the final exam is an oral exam which a student passes or does not pass. Dyslexic students would have an opportunity of support. However neither the staff nor the students are familiar with that opportunity.

Are computers allowed in exams?
This depends on the type of course. When students want special conditions at an exam because of dyslexia they need to contact the professor at the beginning of the course who should give further advice.

Can spellcheckers be used in exams?
Same answer as the previous one.

Country - Canada
What % of course marks depend on the final exam? (Typically)
Each university is different. Often 50%

Are computers allowed in exams?
Sometimes

Can spellcheckers be used in exams?
Sometimes

Country - Egypt
What % of course marks depend on the final exam? (Typically)
Typical percentage of course marks that depend on the exams are 70 / 80 %

Are computers allowed in exams?
Computers are not allowed in the exams.

Can spellcheckers be used in exams?
Spell Checkers can not be used in exams as answers are handwritten.

Country - Japan
What % of course marks depend on the final exam? (Typically)
Depends on university and professors. Attendansce, reports and course works are considered. Also good relationship with the professor. I would say about 50%?"

Are computers allowed in exams?

It depends also. If you ask for 'yes'.For course works definitely 'yes'. Students have to submit in typed form.

Can spellcheckers be used in exams?
In Japanese language we don't have any spellcheckers.

Country - Poland
What % of course marks depend on the final exam? (Typically)
It depends on the type of course - if it is a lecture, then usually 100% of mark depends on the final exam (written or oral - depends on the professor, number of students etc.). If it is some other type of course (laboratory, seminars, practical classes), it depends on professor. Usually the mark is based on written tests taken few times during the course, some paper prepared at home, sometimes activity during the classes is taken into consideration. However, it is the most common rule, that the course on given subject is composed of both lectures (given by professor) and seminars (run by assistants). In such a case the student receives the mark for seminars first, if it is positive he/she is allowed to take the exam (based on the lectures) and the final mark for the whole course is in 100% based on the mark for the exam. Sometimes it is possible to be released from the exam, if the mark for seminars was very good.

Are computers allowed in exams?
Computers are not allowed in the exams.

Can spellcheckers be used in exams?
Spellcheckers are not allowed. They are not very popular in Poland yet.

Country - Romania
What % of course marks depend on the final exam? (Typically)
There is no rule in Romanian education; in the formal way, course marks depend 30 to 50% on the final mark, but the final exam is often 100% important.

Are computers allowed in exams?
Computers are not allowed in exams, except the exam is measuring the ability of using computers.

Can spellcheckers be used in exams?
Not used.

Country - Spain
What % of course marks depend on the final exam? (Typically)
In Spain 70% of marks depend on final exam or exam + essay. 30% on course work.

Are computers allowed in exams?
Computers are not allowed.

Can spellcheckers be used in exams?
Spellcheckers are not allowed.

Country - Sweden
What % of course marks depend on the final exam? (Typically)
Not really applicable. we do not do "final exams" in the UK way - see attachment! Usually, there is a major paper towards the end of an education, perhaps equivalent to 1/2 or a full term of studies, yielding 10 or 20 credit points (one year yields 40 points).

Are computers allowed in exams?
Yes, if you are disabled.

Can spellcheckers be used in exams?
Yes, if you are disabled.

12. Choosing the right technology for you

Abi James

Previous chapters discussed the types of technology to help overcome dyslexic difficulties. This chapter provides advice for individuals looking at purchasing technology for themselves. It will identify technology to help individuals with task and skills with which they may have difficulties. Some of software applications that are available at the time of writing (November 2004) have been specifically mentioned along with an indication of price. Details of how to find out more about the products are listed in appendix 1.

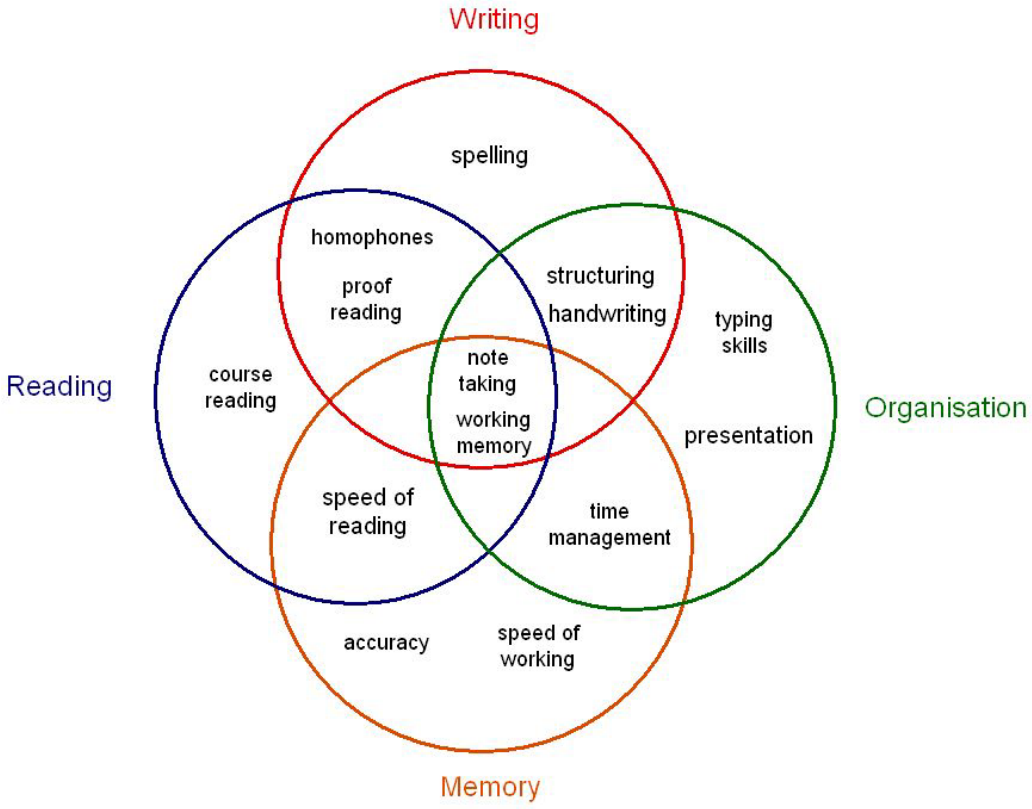
A version of this chapter will be updated with the latest technology information and be available at www.dyslexic.com/.....

There is so much technology available it is important to ask yourself some questions before jumping right in and buying the one with the bells and whistles.

First ask yourself these questions:

- *Prioritise the activities and tasks with which you have most difficult.*

The diagram below shows some of the skills and tasks you may have difficulty with. Every person with dyslexia is different and each individual will find certain tasks more difficult than other.



- How much money do you have to spend?

Assistive technology tends to be expensive because it has been developed for a small market and often require more support and development time because of its complexity. Try to find out details of all the functions in the program – not just the ones on the marketing literature. You may find that non-specialist software will do the same job.

- *How long is going to take you to learn to use the technology? Are you going to require training?*

Remember to take into account how much time and support you are going to need to learn to use the technology effectively. It may be better to stage your purchases so that you have time to learn each one. Try to find someone you can talk to who already uses these sorts of tools to see how difficult it is to learn. If you are not very computer literate it might be worthwhile spending that bit extra to get one combined package to suit your needs as it will reduce the time it takes for you to become confident with using it. It is worthwhile finding out if there is anyone local who can train you on any particular tools first as this might influence what you purchase.

- Buying from the cheapest source or the manufacturer is not always best. After-sales support is particularly important with technology that interacts with other applications such text-to-speech tools. Problems can arise when new patches or updates are released for the operating system or if you just load up a new program. Make sure you purchase your equipment from a company that can support all your needs.

- *What operating system are you going to users?*

If you are not going to be using a PC running Microsoft Windows, you will be limited in what technology is available. More software is being developed for Macintosh all the time but there is limited assistive technology for UNIX while client systems such as Citrix MetaFrame or Terminal Services do not always provide sound support and many programs have licensing issues. The applications discussed here are all available for Microsoft Windows.

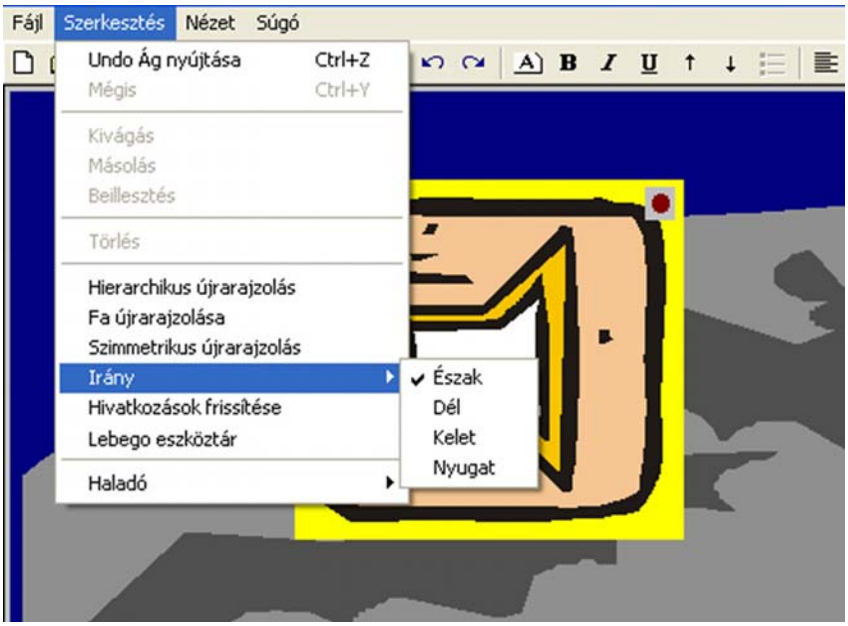
- *How portable do you want your solution to be?*

If you are after something to support you when you are not in front of a desktop computer there are solutions available other than a laptop computer. Handheld spell checkers and dictionaries enable you check a spelling or look up a while scanning pens can let you store information to be transferred to a computer. These will be discussed more in the section about making notes when reading. Portable word processors can provide a way taking down notes or writing away from the computer, while Palm handheld organisers provide many useful tools for organisation. Assistive programs are starting to be developed for these platforms and will be discussed in more details in the Organisation section.

Before you start – learning to type.
If you have not used a computer before to produce written work, it is important to develop quick and accurate typing skills as swiftly as possible. There are numerous typing tutors available but make sure you chose one that matches your keyboard layout and that is dyslexia-friendly. Typing Instructor Deluxe is a good English language/QWERTY keyboard software package and includes lots of practice materials and games. Typing Master is available is a number of languages and keyboard layouts – Spanish, French, German, Italian, Portuguese, Dutch, Finnish and English.

Writing – Planning and structuring written work
Many people using graphical organisers, concept or mind mapping applications find them to be great tools for planning writing. There are numerous applications available and, because they are useful to everyone, they tend to be affordable. Some programs – Inspiration and MindFull are two – are more illustration based than others and suit kinaesthetic learners. Inspiration is only available in English and US Spanish but MindFull is available in many European languages. MindFull also has drawing capabilities. Mind mapping programs that have been developed for business, such as Mind Genius (English) and Mind Manager (English & German), tend to be more complicated to use and have many more functions including linking into MS Office applications. Most mind mapping programs have demo versions available to try out the programs. It is worth using the opportunity to compare them yourself to find out which application suits your working style.

A Hungarian version of MindFull



Writing – Overcoming spelling vocabulary and proof reading difficulties
Most word processing packages come with some type of spell checker which will pick up errors or words that are in its dictionary. Although spell checkers can be invaluable they can also not provide a full solution:

- A spell checker may query an unusual or specialist word that is spelt correctly. If you find it difficult to identify if the word is spelled correctly you may want to use a specialist spell checker or dictionary covering your area. Spellex produce spell checkers that cover many scientific disciplines for English.

- You may find that the spell checker is unable to suggest the correct word as it is unable to cope with your type of spelling errors. It is worth looking at a phonetic spell checker with is designed to pick up dyslexic-type spelling errors. Franklin manufacturer a variety of handheld spell checking devices while Spell Catcher is an advanced spell checking program covering 10 different languages including English, French, German, Spanish and Italian. It also has the additional advantage of working in any application so that you get the same spell checking support in any application. [add about Bodil's spell checker]

- You may find it difficult to identify the correct spelling in the suggestion list of the spell checker. This can be overcome by having the suggestion list read out or by looking at the dictionary definition of the word. ClaroRead provides an alternative dialogue box for Microsoft Word's spell checker enabling the list of suggestions and definition to be read aloud.

If you have problems recalling the correct word or severe spelling difficulties you may a word bank application useful. Wordbar provides a grid of words at the bottom of the page which when clicked on are entered into to the application you are using. These grids can be in made in any language as they support accented and special characters. Words in the grid can also be read aloud to help you select the correct one. This uses a speech engine so you need to make sure that you have one for the language you are using. Speech engines for European languages are available from [MS, Diagio, RealSpeak. AT&T]

If proof reading is a difficult task then you should look into using a screen reading tool to read back your text which highlight the text as the same time to help you identify errors. textHELP Read & Write provides a great support tool if you are using English as, as well as reading back your documents while highlighting the word, it also has an advanced spell checker, dictionary and homophone checker. WordRead and ClaroRead both provide speech feedback with highlighting in a variety of languages.
Writing – Speech Recognition

Speech Recognition technology lets you dictate either directly on to the computer or through a digital recorder that works with a speech recognition package. As speech recognition packages always produce correctly spelled text there are great advantages with this approach for those who can dictate. Dragon NaturallySpeaking is available in French, German, Italian, Dutch and Spanish (the English speech engine is also included). However there are some issues you need to consider with speech recognition technology:

1. Hardware – Speech Recognition software packages are very processor and memory intensive. You will also require a good quality soundcard and microphone. It is best to contact a specialist supplier before you purchase any software or hardware to find out the latest advise.

2. Dictation skills – Current speech recognition packages alllows dictation to be in phrases or sentences, not just spoken single words. This means you have to be able to confidently and consistently dictate. Before purchasing speech recognition software try dictating your work into a recorder or directly to someone. Make sure you are comfortable with this approach.

3. Proof Reading – Although speech recognition packages will always transcribe your dictation with perfect spelling they may not always write the correct word. Most packages now come with text-to-speech tools so that your transcribed text can be read aloud. However if you think you will find it difficult to remember what you have dictated it is worth using a digital recorder (such as the Olympus DM-20) to record your dictation before transferring into a speech recognition package so that you have something to refer back to.

For further information on speech recognition consult at Chapter 13

Reading – using a computer to read text
If you want support with reading text on a computer screen then you can use the same speech programs mention in the proof reading section. However, if you need help with reading paper-based text you must get it on the computer. Optical Character Recognition or OCR programs such as Abbyy FineReader Pro and OmniPage convert scanned images into editable text documents. Both of these packages can convert text in numerous languages. Some specialist packages have OCR functions built-in. Kurzweil 3000 will scan and read in English, French, German, Spanish and Italian while ClaroRead includes OmniPage.

Reading and making notes
If you have difficulties with copying down text from books then you may find a scanning pen useful. The same size a normal pen you role the tip over printed text and it then stores in on the pen until it is transferred to a computer. The QuickLink Pen Elite can recognise text in English, German, Swedish, Portuguese, Spanish, Italian or French. It can also read aloud English text and

include English definitions. Alternatively if you need help with reading words and don't have access to a computer then you may find a Reading Pen helpful. With a Reading Pen you can scan in a word hear it read aloud, hear each letter and its definition. The Reading Pen is available in UK, US, German, Dutch and Swedish.

Preparing for a Need's Assessment
If you are lucky enough to have access to a professional needs assessment there is still some preparation you can do to make your needs assessment more tailored to you needs.

- Talk to other students studying your subject who have already received equipment. Find out what they have found most useful.

- Workload throughout your course. Find out about the expected workload throughout the length of your courses, particularly how frequently you will be expected to do written coursework.

- Think about what experience you have at with computers before. Although it may be exciting to be offered lots of different pieces of software and hardware it is going to take time to learn and become proficient with each one. Be realistic about how long this will take and make sure you take up any training opportunities.

- Find out about what computer systems and software packages you will be using throughout the length of your course. It is important that your specialist equipment is compatible with it. If you are going to be using Apple Macintoshes during your course it may be more appropriate to use specialist technology on this platform. Most tools, apart from speech recognition, are available for Mac.

13. Using speech recognition with the multilingual dyslexic adult

Linda Siegel

What is speech recognition software and why use it with dyslexics?

Speech recognition software allows an individual to talk to into a microphone attached to a computer and what the person says appears on the screen. The computer transcribes what the individual says. There are several reasons that this is very useful for dyslexics. Dyslexics (and most people) can talk faster than they can type. Composing puts demands on working memory because one must remember the beginning of the sentence while writing the end of the sentence. Talking, instead of typing, would help most people. Talking while composing allows one to be much more spontaneous. Thoughts can come out more quickly without being slowed down by typing. Dyslexics have trouble with fluency when they read, but usually their oral language is reasonably grammatical and articulate. It makes sense to think that it would help them if they could express their ideas verbally instead of writing them down.

> Multilingual dyslexics have the added burden of having to function in a second or additional language that is not their native language. Many dyslexics can speak articulately and fluently but the problem comes when they need to put their thoughts on paper, especially if they are writing in a second language.

Who is the multilingual dyslexic?

There are a number of issues and defining who is the multilingual dyslexic. How do we know if the problems that the individual experiences are due to dyslexia or just to the fact that they are required to function in a language that is not their first language? The usual tests for dyslexia have a heavy language load and if the individual is not fluent in the language, it is obviously very difficult determine whether or not they are dyslexic. The definition of dyslexia assumes that an individual has been educated in the language in which he or she is being assessed, so that if there has not been sufficient education in that language, it is very difficult to separate a language disability, such as dyslexia, from a problem with acquiring the second language.

Although the answers to these questions are never easy, there are some guidelines. It may be possible to compare the student with others of the same first language who have been educated in their second language for a comparable amount of time. If the multilingual individual is having more difficulty than average, then this suggests that he or she may be a dyslexic. Also, it may be possible to compare the reading, spelling and writing errors of

the multilingual student with dyslexic native speakers of that language. If the errors are very similar to native speakers who are dyslexic, then this suggests that a diagnosis of dyslexia is appropriate.

It is very important to examine the amount and nature of the schooling. There is, unfortunately, no good research on these questions but the following guidelines that may be useful. Generally, in the age range of five to nine years, with one year of schooling in a language, an individual without specific learning difficulties can achieved some reasonable fluency in reading and oral language. In the age range of 10 to 12 years, it takes longer, perhaps two to three years. After the age of 13, that is 13 years older it will take three to four years. These are only guidelines and they may be individual differences in circumstances that prevent a definitive diagnosis. It is important to recognize the difficulties early and to provide support for the individual as soon as possible.

Case studies

I will discuss the use of speech recognition software with two multilingual dyslexics. Speech recognition software requires that you teach the computer to recognize your voice and you do this by reading a passage so that the computer can hear how you say the sounds in words. Dyslexics have trouble reading accurately, especially when required to read out loud, so this presents a challenge to training the computer to recognize the dyslexic's voice.

I will describe the difficulties encountered by these two individuals and discuss some of the measures that might help them overcome their difficulties with voice recognition.

Veronika

Veronika is from the Czech Republic; her first language is Czech. She studied English for 10 years in the Czech Republic and has studied for 6 years in a Canadian university, since she immigrated to Canada. She speaks English fluently with few if any grammatical errors but with an accent reflecting her native language.

She claims to be dyslexic in both Czech and English. Veronika notes that she has difficulty with decoding, spelling, writing and arithmetic in Czech and also a slight speech difficulty. Veronika has difficulties in both English and Czech in decoding new words, spelling, grammar, and the pronunciation of certain letters, for example, the r sound.

Veronika experienced a great deal of difficulty when she attempted to train the speech recognition software to recognize her voice. She had trouble reading out loud and stumbled over some of the words. The computer had difficulty

recognizing her pronunciation of some vowels and certain consonants because the pronunciation was so different from Standard English.

Anat

Anat is from Israel and she came to Canada 6 years ago. Although she speaks English very fluently (with an accent reflecting her native language, Hebrew) and rarely makes any grammatical errors, she has trouble writing in English, especially with English grammar, which is very different from her native language. Anat had difficulties with spelling, decoding new words, and grammar in writing but not in speaking. Anat's spoken English is excellent but in writing she has trouble with plurals, verb tenses and auxiliary verbs, prepositions and possessive pronouns because the grammar of English is so different from her native language.

Anat experienced difficulty when reading the passage necessary to train the software. Unlike Veronika, the problems were not so much with pronunciation but with grammatical errors that she made even when reading the passage. She also stumbled over longer and unfamiliar words.

How to help the multilingual dyslexic learn to use speech recognition software.

I will describe some techniques that were helpful with these two individuals.

In order to train speech recognition, the individual must read a passage out loud so the software can match his or her voice with words in its dictionary. This reading out loud is obviously very difficult for dyslexics and many individuals who are working in a second language. The passages available for reading out loud in voice recognition programs are sometimes very difficult and contain multisyllable words that are hard to pronounce, for example, the word *Carnegie* appears in one passage. This is a very difficult word to pronounce and it is an irregular word, as many names are because they reflect the language from which they came.

Multilingual dyslexics have a number of problems using speech recognition software. As they are likely to have difficulties with word recognition, especially unusual and/or multisyllable words, practice with decoding the words is very important. To help with this difficulty it is important to have the person practice the passage many times so he or she becomes quiet familiar with it. This practice will help achieve the student achieve fluency.

Vocabulary training would help dyslexics with some decoding problems, especially learning prefixes and suffixes if the language is English.

Using a speech recognition program requires proofreading because it is important to correct the computer's errors as soon as they occur. Dyslexics have difficulty with proofreading but if they are aware of the problem and if large type is used, it will help. It is also possible to have the software read back to the individual what he or she has dictated. This will catch some proofreading errors.

It is important that errors be corrected soon after they occur, preferably no later than one paragraph later as this helps train the program and help reduce or prevent further mistakes.

For both the individuals described above, the speech recognition program had particular difficulty with understanding their production of vowels. However, some consonants were also problematic. One possibility is to use accent adjustment software. This software will help pronunciation because it provides feedback from a comparison of the waveform of the output of a native speaker and the multilingual dyslexic who is speaking in a second language.

It is possible to set the speech recognition program to respond more slowly but to be more accurate. Slowing down the pace will improve accuracy and avoid some of the frustrations that the individual experiences when the computer does not recognize what it says. The speech recognition software can also be set so there are more options if it does not correctly recognize what is said.

Why use speech recognition if it is so difficult?

It may seem that learning to use speech recognition software is a great deal of trouble. Is it worth it? With patience, dyslexics can learn to use it. The experience of some multilingual dyslexics is that it helps the fluency and quality of their writing. They report that it also gives them more self-confidence when writing. It seems that it is certainly worth the effort to try it with multilingual dyslexics.

14. What do we need now?

Ian Smythe, EA Draffan, Paul Blenkhorn, Linda Siegel, Eva Gyarmathy, Georgiana Ghitulete, Bodil Andersson

This chapter forms the basis of the pilot projects which will take place in selected countries, and is a natural development of the preceding activities as set out in the chapters of this book. The recommendations are with respect to practical considerations and financial limitations.

The research conducted in this project identified the framework for development of systems to support the dyslexic individual, either directly through ICT, or through the human based support system.

Recommendations as outlined in the various guidelines (for support, assessment and training) will all take time. There would be the time needed for research and development of test material, the time taken for training the trainers, and the time to develop software. This would allow countries which did not have the current support to develop their own systems. However, this makes the assumption that the systems currently used in places such as England, Denmark and Sweden are the right solution.

Consideration of the various factors and limitations suggested that there may be an alternative approach which not only may be more beneficial, but also may be evaluated within the timescale of the project.

The first problem was to identify what should be the aim of this support, and then how it may best be achieved, making no assumptions about what currently exists.

It was realised that the aim should be to enable the dyslexic student to have greater autonomy in the learning environment, using where appropriate the technology to support the individual.

However, it was realised that one of the limiting factors was always the availability of tutors to provide support, and to provide it in the appropriate languages.

For this reason, it was decided to use an alternative approach, whereby each student would be given a CD of study skills presented as self-learning multimedia e-learning. Thus the student would be provided the knowledge for self awareness and understanding of difficulties, being trained in the many areas where weaknesses are known to exist.

The development of the CD based learning frees the dyslexic student from some of the ties to the human support. This is not to suggest that there is no

need for human support, but to acknowledge that training of support may take time, and the support tutor is not always available.

The testing languages/country contexts were Wales (English and Welsh), Hungary and Romania. A Swedish version has also been planned.

It was decided that the CD should contain the following:

Study skills e-learning
Free trial software

The study skills would include the following;

An awareness and understanding of dyslexia
Reading
Planning and concept maps
Essay and thesis writing
Proofreading - A guide to using spellcheckers and grammar checkers
Taking notes
Revisions and Examinations

Using ICT

Introduction
Computer settings
Microsoft Word
Concept mapping
Text to speech
Spellcheckers
Speech to text

Software that will be on the CD will be as follows:

Mindful – a concept mapping tool available in Hungarian, Romanian, English, Welsh and Swedish – time limited

EdWord – A free English talking word processor.

Readability – Trial version of software to modify system colours and fonts.

Student evaluation
A number of students identified as dyslexic were provided with the CD in order to evaluate its usefulness. The students chosen will respond to a specially prepared questionnaire which is designed to evaluate a) the apparent usefulness of the information on the CD, the apparent usefulness of the software provided, and what further support they feel they would need.

There will be a comparison study in England where a fuller support system is available. In particular, evaluation will seek to understand to what extent the dyslexic individual can become more independent. Furthermore, there will an attempt to understand how much non-dyslexics like to use the software. If the dyslexic individual needs the accommodations, then it should possible to show that the dyslexic gains more from the software.

Part two: The countries

Introduction to Part 2

Ian Smythe

In this second part of the book we have attempted to provide information from as wide a selection of countries as possible. As the reader will see, the responses are diverse in nature, due to the variability in the level of support offered and resources available. It also reflects that the countries included go well beyond the project partners. These individuals contributed because they wanted to make a statement. Some make little reference to ICT demonstrating a lack of resources. Others highlight some of the issues at a pre-university stage. This is dues to two reasons: a) that there is nothing to report at university, but a contribution was wanted, and b) it was felt important to highlight the provision given at pre-university for one of several reasons, including the fact that many dyslexics had been helped to get to university, and at the point of which they most need the support, there is none available.

Partners felt they wanted to demonstrate what was available as widely as possible and therefore sort contributions from a range of sources outside the original partnership. For example, it was felt that it would be good to include an understanding of the Arabic language in this context due to the high prevalence of Arabic speakers in parts of Europe (e.g. 25% of the population in parts of southern Sweden). Countries where there is a low level of dyslexia support, and where English is required for university entry (e.g. Hong Kong and Japan) were also included in order to make comparisons and to help those in Europe supporting students from further afield understand why they have such difficult in their own countries.

Some of the issues discussed reflect a similar concern of the partners. However, provision in countries usually starts with the school based support before the higher education support. Therefore, it was important to address what were seen as the precursors of university support, so that it was clear at what level the provision was (or was not) being provided.

Use of references has been minimised. Where more information is required, readers are encouraged to contact the author. They may also find more non-ICT related information in The International Book of Dyslexia (see the links on the project websire - http://www.welshdyslexia.info/minerva/links.html)

Overview of national policies

One of the areas of the project was to identify policies which allow students to fully utilise the technology and financial assistance available in each country, and compare and contrast across countries, as well as their relationship to EU directives. However, the partners agreed that as far as possible the project should attempt to avoid duplicating information that could be obtained

elsewhere. For that reason, two major EU databases with respect to higher education have been extensively consulted, and the reader is referred to them for more in-depth information where required. Each individual then provided information within their chapter that reflected the situation with respect to local legislation. The two databases are Heag and Eurydice.

For accessibility services – The Heag database
http://www.heagnet.org

From their website: “The aim of this database is to provide a coherent guide with information regarding disability support services in seventeen European countries, which may help students and their teachers make decisions about possibilities for study programmes and exchange activities. The HEAG database lets you search for specialist services and accessibility support for students with disabilities in Higher Education in Austria, Belgium (Fl), Belgium (Fr), Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden and UK.”

For a guide to the education systems of Europe
Some of the chapters in this section provide a brief overview with respect to the educational system in their respective countries. However, the partners felt that this could duplicate what was available elsewhere, and was not the main focus of the project. Therefore anybody who has an interest in understanding the educational system of the country do so by consulting online databases, the most important of which is Eurydice.
http://www.eurydice.org/Eurybase/frameset_eurybase.html

From their website: “Eurydice is committed, first and foremost, to offering policy-makers and all those involved in the provision of education with information and studies geared to their needs. The Network boosts European cooperation in education by developing exchanges of information about systems and policies and producing studies on issues common to education systems.”

Another resource is the website of the International Associations of Universities http://www.euroeducation.net. This provides further information to compare pre-university educational provision.

Austria
Hermine Posch

Country

Year of entry to EU: 1995
Political system: Republic
Capital city: Vienna
Total area: 83.858 km²
Population: 8,1 million
Currency: Euro
National Language: German
Numbers of students in higher education: 191.787*
*http://www.oefse.at/download/bzastat/tabelle1.pdf

Data:

In Austria 52 questionnaires were distributed to the Austrian Ministry of Education, to university institutions (universities and *Fachhochschulen,* and to teacher training colleges. The rate of return about one third of the total number distributed.

Familiarity with the terms

It was assumed that the general awareness about dyslexia compared to other countries is low. For that reason two more questions were introduced:

1. The familiarity with terms
2. The experience of the lecturers in practice

Referring to the first question the results showed that only a few were not familiar with terms such as “Reading and Writing Difficulties”, “Legasthenie” (the German term for dyslexia) and the English term “Dyslexia”. Teacher training colleges were the best informed institutions.

In the second questions it was asked whether the lecturers thought that they had met a dyslexic student in their career so far. Most of them, especially participants from *Fachhochschulen,* were sure that they had never met a dyslexic student at their institution. Participants from teacher training colleges were the most careful to answer with a clear “no” but assumed that there might have been some students who were probably not recognised as dyslexic; some of them clearly had contact with dyslexic students. Only two of the other institutions (one each) came across a dyslexic student so far. Nearly none of the institutions could suggest any percentages for the number of dyslexics at their institution. Only one participant from a teacher training college assumed that 1 % of the students may be dyslexic.

Legislation

What is the definition of:

a) disability

The following outline refers to the *Austrian Federal Government´s Disability Concept* (1993)
http://www.bmsg.gv.at/cms/site/attachments/5/3/2/CH0055/CMS1057914735913/behindertenkonzept_eng.pdf

> "Disabled persons are persons of all ages who have a permanent and substantial physical, mental or emotional impairment in an area of social relationships important to their everyday lives. Persons who are threatened with such an impairment in the foreseeable future are also regarded as disabled.
> Areas of social relationships regarded as vital are child-rearing, education, employment, other occupations, communication, living and leisure activities."

> "Disabled persons are those persons who are not able to
> - sustain regular social relationships,
> - acquire and perform gainful employment and
> - achieve a reasonable and adequate income without assistance."

According to section 12 of the Federal Constitution, the responsibility for basic legislation lies with the Federal Government, whilst the provincial authorities are responsible for implementing legislation and enforcement (e.g. care of the poor, maternity care, infant and youth care, hospitals and nursing homes).

Austria´s disability policy should be oriented towards the following principles: prevention, integration, standardisation, self-determination, helping people to help themselves, finality, normal place of residence,
customisation, decentralisation, smooth transition, rehabilitation, mobile and community assistance, transparency, accessibility of assistance.

Further links for revised parts:

http://oear.or.at/Recht/bundesbehindertengesetz2001.htm#1-1 – 2001 some parts revised parts

http://www.parlinkom.gv.at/pd/pm/BR/I-BR/his/060/I-BR06054_.html - 2003: slightly revised

b) dyslexia

In Austria all nine provinces have different regulations for the way to deal with dyslexia, most of them appeared between 1996 and 2000. This results in a very complex pattern. The overall tendency is to avoid the medical term "Legasthenie" which is similar to "dyslexia" and move towards a descriptive

definition focussing on cognitive processes that are at work during reading and writing.

In 2001 the Austrian Ministry of Education published a brochure on the treatment of reading and writing difficulties as well as dyscalculia. The brochure gives an overview of all regulations and definitions in the provinces and describes reading and writing difficulties respectively dyslexia as follows:

> Reading and writing difficulties refer to a weakness in reading and/or spelling which lays under the average respectively individual standard you would expect to occur. (criteria of discrepancy) These difficulties (occurring sometimes only temporarily) can be based on various causes, e.g. problems of fit between the individual rate of performance and learning programmes offered by the school.
>
> Weakness in reading and/or writing in the clinical-psychological sense (mostly referred as "LRS" – or "Legasthenie/Dyslexia") refers to the assumption of functional disorders in perception, processing and reproduction of information. The manifestation of the weakness in reading and/or writing can be noticed by error persistence even under optimizing the pedagogical support by the school (criteria of resistance) or if the errors persist further on in some other kind (criteria of persistency).
>
> The disorder (and along with that the concept of support and treatment) has to be separated from
>
> - other receptive disorders (e.g. visual and hearing impairment)
> - expressive disorders (e.g. disorders in language development)
> - motor difficulties
> - specific psychological disorders with communication problems
> - general weakness in learning or other cognitive disorders
> - learning deficit
> - difficulties due to ethnical/cultural problems in second language acquisition etc.

Some provinces define dyslexia according to the International Classification of Psychological Disorders ICD 10 and DSM IV. According to these definitions reading and writing disorders are based on insufficiently developed and established basic functions in the field of perception, motor skills and integration processes between perception and motor skills. This disability is separated from mental disorders, sensory impairment, and inadequate teaching methods. Furthermore a significant discrepancy between reading and/or writing abilities and the intelligence is mentioned. However, school authorities wanted to supplement the international classification with concepts of reading and writing acquisition and the emphasis on phonological awareness deficits in order to account for latest results in research and to be useful for school.

(compare: Sedlak, Franz, Hrsg. (2001), Die schulische Behandlung der Lese-Rechtschreib-(Rechen)schwäche. Eine Handreichung. Das Zukunftsministerium. Wien: bm:bwk.)

c) Is dyslexia a disability?
In the pedagogical sense dyslexia equals the German term “Legasthenie” which is seen as stigmatisation and outdated. The term is increasingly replaced by “general difficulties in reading and/or writing”. All children who have reading and writing difficulties shall be supported by an adequate school program.

Medical doctors, however, rather use the term “Legasthenie” (dyslexia) , a complex syndrome that can be diagnosed from a very slight form of disability up to a serious affection. Dyslexia is seen a serious disability when it is accompanied by behavioural problems and after long observation through multiprofessional diagnoses, controls and proof of ineffectiveness of adequate support through school. In that case they refer to regulations from 1965 that are based on a law that was made for war victims in 1957 (section V, mentally disabled, position 594 to 599).

Guide to the education system with particular respect to university
General guide or link to a web site is acceptable
The Austrian Federal Ministry of Education, Science and Culture (bm:bwk) provides the University Act 2002 in German and English on the following websites:
http://www.bmbwk.gv.at
http://weltklasse-uni.at

A well structured overview of the organisation at the Austrian university is given in
http://www.bologna-berlin2003.de/pdf/Comment_Austria2.pdf

*Guide to disability in higher education r*elevant for information
The Austrian University Act 2002 mentioned above addresses disability matters, however, dyslexia is not mentioned explicitly.
Austria´s policy on Special Needs Education is included in the publication of the European Agency for Development in Special Needs Education called “Special Needs Education in Europe” (January 2003). This work can be downloaded from
http://www.eurydice.org/accueil_menu/en/frameset_menu.html

An interesting study concerning the situation of disabled students and students suffering from health difficulties at Austrian academic institutions was published in May 2003 and can be downloaded at the following address:
http://www.bmbwk.gv.at/start.asp?bereich=1&OID=9051

None of the addresses above mentions dyslexia explicitly.

What legislation supports dyslexics/disabled students?
Some passages in the University Act 2002 of the Austrian Federal Ministry of Education, Science and Culture (bm:bwk) that will be introduced in January 2004 offer an opportunity for dyslexic students, e.g.
Part I (Organisational law), Chapter 1 (General provisions):
- 1st Sub-chapter (Principles, responsibilities and scope of application), §2, number 11 (Principles)
  The 11th principle emphasises the special attention to the needs of the handicapped.
- §§ 2 and 3: The university is required to offer adequate concepts for handicapped, students who are in a working process or who need to take care of someone, for seniors, and distance learners. Furthermore, the university shall provide an adequate infrastructure for the handicapped in their buildings and offer adequate teaching (e.g. online-lectures for blind students, interpreter for sign language).

Part I, Chapter 3 (Students/Rights and duties of students):
- § 59. (1), number 12:
  Students have the right to be examined according to an alternative method if they suffer from a permanent disability which makes it impossible for them to take an examination in the prescribed manner, and if the other method does not limit the content and standards of the examination. Exam procedures are not linked anymore to a certain law but have to be arranged by the university in particular cases.

These passages can be found at:

http://www.bmbwk.gv.at or http://weltklasse-uni.at (German and English) and http://www.unigesetz.at (German only)

Assessment

Who conducts the diagnostic assessment?
Participants from the university institutions did not know who was authorised to carry out an assessment (one of them suggested a specialised institution). Most participants from teacher training colleges claimed that specialised teachers, psychologists and specialised institutions could assess dyslexics. Within Austria there are various regulations. The main rule is that specialised teachers or the classroom teacher initiate a pedagogical screening. Based on these results they may assume dyslexia and advise the parents to do a psychological test with their child only psychologists are supposed to do. There may be other institutions carrying out dyslexia diagnosis but the teacher may refuse to recognise that paper if it does not follow the official regulations of the region.

The Austrian Ministry of Education advises parents to reflect on the qualifications of a specialist and published in the brochure “Die schulische Behandlung der Lese- Rechtschreib-(Rechen)schwäche. Eine Handreichung.“ Das Zukunftsministerium. Wien: bm:bwk, (Sedlak, Franz, 2001).

What are the qualifications of the assessor?
Participants of university institutions and one teacher training college were not able to respond to this question. Most teacher training colleges thought that the qualification should be that of a specialised teacher or a psychologist. This corresponds to the fact that teachers can carry out pedagogical tests whereas only psychologists are allowed to do psychological tests. In practice both complement each other.

How do you get an appointment?
Students get an appointment mainly on their own initiative. One participant at one of the universities suggested that the office for student affairs should advise students. One institution noted a lecturer from the staff who is specialised in the field of dyslexia and gives advise to dyslexic students when needed. Most institutions did not know how students get an appointment. There is no general advise to dyslexic students before they enter university or a college.

Who funds assessment?
The participants of the questionnaire either assumed that there was no funding of the assessment or claimed that they did not know if there was some. At present in Austria there are the following possibilities:

Government (central)
In Austria the assessment conducted by an educational psychologist is free.

Private
If another psychologist is chosen by the parents – depending on the diagnosis - parents get a certain percentage refunded. This diagnosis has to include other psychological disturbances such as e.g. anxiety besides dyslexia. In cases of low income parents may receive some additional support by local institutions.

Institutional
Parents have to pay privately when their dyslexic child Is diagnosed by a private dyslexia institution. In some regions local authorities may support parents with low income.

What is assessed and what tests are used?
In the questionnaire university institutions and some teacher training colleges did not know about assessments or tests that are being used. One participant

of a university institution thought that there were no tests at all because dyslexia was not recognised.

Cognitive, Attainment
There is a range of tests psychologists use depending on their choices. These may for example include Wechsler Adult Intelligence Scale (WAIS) or the "Rechtschreibtest für Erwachsene" (RST – Writing test for adults). Other tests may be necessary for disturbances that may accompany a dyslexic adult (e.g. anxiety, low self-esteem etc.)

Personal history
In the questionnaire one participant of a teachers training college mentioned a personal interview, observations of visual and auditory information processing. This may also be included in the cognitive assessment report carried out by a psychologist.

Where are the diagnostic assessments conducted?
In the questionnaire most did not know the answer.
One technical university mentioned that there exists a working place for the blind but nor for dyslexic students. Two teacher training colleges provide a seminar room or a lecturing room for assessments. The others suggested that the student would have to go to a psychologist´s office, which is done in the most cases.

Who conducted the needs assessment or any other assessment that occurs at a different time to the diagnostic assessment?
Most participants could not answer that question, one institution mentioned the student´s own responsibility to care for her/his needs assessment.

Technology
One technical university mentioned spell-checkers that are standard for all computers and can be used by all anyway.

Exam provision
One university institution gave the following response:
The university offers support only when students contact the person in charge (at the moment the dean of the university). Support is possible as the University Act proposes that students who are affected must prove that the disability has been going on for a longer period of time. If the kind of disability hinders the student to take exams in the required form an alternative method can be approved. (§ 54 subdiv. 3 UniSTG). Such requests are rather rare but are usually corresponded to.

Support
In the questionnaire one university institution noted that the course lecturer who would assist the student in finding appropriate support.

What are the consequences of the assessment?
One participant of university and one from a teacher training college mentioned technical equipment that they offer to dyslexic students. One participant of a *Fachhochschule* said that a dyslexic student would be advised to undertake an external therapy. All others did not know about any consequences an assessment would have at their institution.

Technology provision
At the technical university every student has got access to a computer and can use the spell-checker. Most institutions did not know of any special programme that was offered to dyslexic students or claimed that there was no support at all.
One teacher training college offers a spelling program and a mind-mapping program (the cost is about 400 Euros) and another one cassette recorders.

When does the needs assessment take place?
As mentioned before the needs assessment requires the initiative of the student (in case she/he finds a person/institution responsible for it).

How easy is it to access?
Once the student is aware herself/himself about her/his dyslexia it is her/his decision if she/he wants to be assessed. It is then her/his responsibility to find out about people/offices responsible at her/his institution.

Is it widely publicised?
In the questionnaire all institutions but one claimed that dyslexia is not widely publicised. If the student has not told anyone about the difficulties they have then there is very little chance of them learning about the support available. In some cases students would rather contact a non-profit dyslexia association and ask for help because they have problems in finding the people responsible at their institution. Such a regional organisation is e.g. the Styrian Dyslexia Association (Steirischer Landesverband Legasthenie STLL). Other regional Austrian dyslexia associations are mentioned in the brochure "Die schulische Behandlung der Lese- Rechtschreib-(Rechen)schwäche. Eine Handreichung." Das Zukunftsministerium. Wien: bm:bwk, (Sedlak, Franz, 2001).

Is there a high general awareness amongst staff?
According to the questionnaire information on dyslexia is best at teacher training colleges but also the awareness amongst university staff is satisfying. However, there is a discrepancy in comparison to staff training that is considered as not satisfying by all institutions. It can be assumed that the

information about dyslexia is taken from elsewhere than the students' own institution.

Technology and support

What software is available? Please advise approximate costs in Euros
In the questionnaires only one institution mentioned software that is available for students:

1. Spelling program €200
2. Mind mapping €200

What other technology is generally available? For example, tape recorders
Only one institution mentioned a tape recorder that is available for dyslexic students.

Are there special places for assistive technology in the university, or is it available everywhere.
Two institutions (teacher training colleges) provide a special room at their institution for dyslexic students. All other participants of the questionnaire cannot think of any special places at their institutions.

Can the technology be taken home or is it only available on the university campus?
No, there is no possibility to take it home. It must be used in the university.

Other
What level of funding is available to students as grants to help support disability?
Dyslexia is not seen as a disability, which means that there is no money available from disability grants unless there are not massive additional disturbances.

What training is available for tutors to ensure dyslexia friendly delivery?
There is no training available for tutors to ensure dyslexia friendly delivery unless it is the private interest of a lecturer to attend such courses (e.g. on teacher training colleges). The easiest access to training would be at teacher training colleges that offer in-service courses for teachers themselves but even there the staff seems to have a problem finding time for these courses.

Are there web sites to support them?
In theory there would be websites available to supply the staff with information about dyslexia but the results of the survey shows a high dissatisfaction of all institutions with support of that kind.

What percentage of dyslexics are at university? Please provide references
There was a study undertaken by the Austrian Institute of Advanced Studies (Institut für Höhere Studien HIS): The situation of disabled students at Austrian universities and *Fachhochschulen*, bm:bwk 2003; http://www.bmbwk.gv.at. This study mentions that 12 % of all students – which makes 24.000 students - estimate to have health problems. Only 1 % speak about themselves as handicapped, 7,6 % define that they suffer from chronic health problems, and 3,3 % speak of other health disturbances. Inquiries about this research showed that dyslexia was not mentioned by the students. The researcher assume that if there were dyslexic students among them at all, there may have been a very few only. It is very unlikely that such students may have categorised themselves as handicapped or having chronic health problems. However, it cannot be ignored that dyslexic students could be among their participants, especially when dyslexia is combined with other health problems (e.g. psychological problems, etc.).
This shows that there may be little awareness on dyslexia among the students themselves or that they do not consider this learning difficulty as health problem.

What are the barriers to dyslexics being at university (e.g. the need to pass exams in a first or second language, or general lack of support from early in their school career)?
One participant from a teacher training college thought that there were no barriers for dyslexic students at all. Another one explained that their students were actually too old (from 18 years onwards), to speak about barriers still. They mastered their education already (A-level, entrance exam). Only in written work (seminar, exams, thesis) barriers could appear. The institution itself would be involved in that topic as courses in that area were offered. One more participant of a teacher training college thought that the kind of qualification students need for the college was the barrier itself. A high proficiency in reading and writing was required as prerequisite and basis for the qualification of primary teachers.

The *Fachhochschule* claimed that there was no concrete support for students. The basis for studying was absolute proficiency in expressive writing. There was hardly any handwriting required so that it was possible to complete scientific work and a whole study successfully. The concentration would be on the quality of the content and not on time pressure (e.g. when reading of special texts is required).

Participants of other university institutions claimed for example that there were mainly emotional barriers for the dyslexic person to overcome. In all language courses the lecturer had not met one dyslexic student.

A barrier might be the qualification for university through a written A-level exam in German which is required and in which spelling plays a central role. That participant did not see any barriers for universities.

Another university participant emphasized that qualifications to enter their university were based on the artistic talent and basic knowledge about the theory of music. During that procedure dyslexic students were not recognized. If there were any problems in the mastery of scientific lectures, there would be an interview with the examiner who would give some advise. During that meeting dyslexia might be assumed and the student might be advised to contact a qualified institution. Such a case, however, is not known. Because of the high percentages of foreign students enrolled at a University of Art the time factor during written work rarely plays a role.

What non-technology support is available?
A few institutions offer sometimes tutorial support which is often a person from staff who is specialised in that area. Those institutions often run in-service-trainings at their institutions. One university institution emphasised that they cannot offer any therapies. They must be organised by the dyslexic students themselves. In some courses it is possible to seek advice through contacting specialised lecturers and support in finding resources from abroad.

Further comments:
The Austrian Ministry of Education stated that there was no state institution available which would be responsible for unifying pedagogical matters on university level.

The University Act 2002 will be the basis for all institutions from January 2004 onwards.

In the questionnaire the participants of nearly all institutions stated that there were no laws, rules or special rights that could be used for dyslexic students. Some of them were not sure about that.

One participant from a teacher training college estimated that the number of dyslexic students, that are students with permanent massive reading and writing difficulties, was very low at the college. Presumably the profession of a teacher is not chosen to a great extent by dyslexics because the proficiency in reading and writing plays a central role. However, uncertainties in spelling can usually be settled by an adequate support.

One institution came up with the following statements:
- Support of dyslexic students during their studies through a better understanding and in consequence a different behavior of the lecturers (e.g. bigger letter size on boards/overheads; other organization of exams (e.g.

oral exam instead of written exam), more handouts (e.g. copied material) instead of taking notes.

- Dyslexics may take longer for their studies because they may need more effort for reading in general. As it is the case with other disabilities, this may lead to problems with receiving grants for a longer period of time. The latest University Act promises to take this problem into account but there is still a problem with the recognition of many disabilities.
- Another problem may be that dyslexics do not contact the service for disabled or sick people because they feel misplaced in any of these categories. The name of the institution which refers to disabilities may be a barrier for dyslexics to seek help and is criticized in the IHS study.

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Provision of Services for Dyslexic University Students in Canada

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Before we begin, I will briefly note the reason for the terminology used in this article. What are called learning difficulties in the Europe and the rest of the world are called learning disabilities in Canada and the USA. What is called dyslexia in the rest of the world, is called a reading disability in Canada and the USA.

Structure of Post-Secondary Education in Canada

Canada is a geographically large nation composed of 10 provinces and 3 territories. Education in Canada is the responsibility of the provincial and territorial governments and not the federal government; therefore, each province or territory develops its own standards and practices in the area of dyslexia. In addition, there are no private colleges and universities and all post-secondary institutions receive funding from the province within which they are located.

This provincial structure means that there are no national standards for the assessment of dyslexic university students and no standards for the provision of ICT services. There is considerable variability among the provinces. There is no system for the identification of students with dyslexia and there is no systematic provision of services for dyslexic university students. Within the Canadian Charter of Rights and Freedoms, individuals with disabilities are entitled to certain rights, including an appropriate education. However, there is no systematic provision for services for dyslexic students that is common to all provinces. Even within provinces, the system is chaotic as each institution makes its own rules. Sometimes, there are not even any rules.

Provision for Dyslexic University Students in British Columbia: A Case Study

Let us consider one province, British Columbia; we will review the provisions for dyslexic university students within that province. These regulations are typical of those in other provinces. The Canadian higher education system is composed of universities, which grant primary, secondary, and tertiary degrees and colleges, which provide more specialized programs in technical or service fields. The colleges have some programs that are similar to those in European technical universities but also programs in non-technical areas, such as fine arts and social service work.

Assessment

In the case of most colleges and universities, students must obtain an assessment to determine whether or not they have dyslexia. The institutions of higher education do not provide the service and the student must go to a private practitioner for an assessment, typically, a psychologist or educational psychologist. Therefore, the student must obtain an assessment at his or her own expense. This is quite expensive and will cost the student (in Canadian dollars) the equivalent of €800 to €1200. This price means that an assessment is too expensive for many of the students who need it.

Once the assessment is obtained, it must be verified with the Disability Resource Centre (or similar office) at the college or university in question. There is no guarantee that the institution will accept the assessment. Many colleges and universities in North America adhere to the guidelines of an organization called the Association on Higher Education and Disability (AHEAD). Similar guidelines are used in many other countries. The AHEAD guidelines, which are seriously flawed (see Siegel & Smythe, 2004, for a detailed discussion of these issues.) The use of the AHEAD Guidelines means that many students will not have access to the appropriate accommodations because they cannot obtain the necessary assessment to document their dyslexia.

The AHEAD guidelines are adamant that the assessment must include measures of “aptitude”, academic achievement and “information processing” Obviously, measures of academic achievement are not only just important, but also critical, to the diagnosis of dyslexia. However, there is no justification for measures of so-called aptitude and information processing in an assessment to determine whether or not there is dyslexia. Furthermore, there is no need for the measures of aptitude and information processing to determine what should be provided to help the individual in terms of remediation and accommodations. I will outline the reasons for this below.

It is important to note that assessment of reading, spelling, arithmetic calculation, mathematical problem solving and writing should be used. Measure of reading should include fluency and accuracy of word recognition and pseudoword reading, and reading comprehension, preferably under both timed and untimed conditions.

Aptitude

However, when it comes to the question of measuring so called “aptitude” or “intelligence,” to define dyslexia, there is a problem. These problems have been outlined in detail in Siegel, 1989, Siegel & Smythe, and earlier in this book, Smythe chapter 4.

According to many definitions, but specifically that of AHEAD, scores on an intelligence test define aptitude. Specifically, the AHEAD guidelines specify that an assessment must include "a complete intellectual assessment with all subtests and standard scores reported." By intellectual assessment they mean an IQ test. For historic reasons, the IQ has gained an illogical status in the assessment of the individual with learning disabilities. Although there may have been some rationale for the use of the IQ test in the early days of the development of the concept of specific learning disabilities to distinguish then from mental retardation, three decades of research have shown it to be irrelevant in both in the categorisation of specific learning disabilities and in the understanding of strengths and weaknesses of those with literacy difficulties. (Siegel, 1989 and other references). However, simple logic can succinctly explain why the IQ is not required in the assessment of the dyslexic individual (Siegel & Smythe, 2004): For AHEAD and the institutions who adhere to its guidelines, the definition of a learning disability means a significant discrepancy between IQ and achievement. For a variety of reasons, this definition has significant problems. For example, there are no differences that have been found in the actual reading skills between individuals with reading problems who have a discrepancy between IQ and reading scores and those who do not. In addition, individual without such a discrepancy, and consequently, lower IQ scores are as likely to benefit from remedial help as those who do have a discrepancy.

Some institutions require a discrepancy between IQ scores and achievement and sometimes this discrepancy must be 2 standard deviations, which is very difficult to achieve, and prevents most students from help.

For most institutions the assessment cannot be more than 3-5 years old. This seems contradictory because is the intelligence test measures potential, it is not clear why should that potential should change with time.

Even once the assessment is accepted, there is no guarantee that the student will receive any help or accommodations. The college or university is not obligated to provide any accommodations.

Some institutions do have centers to help with reading, mathematics or writing skills. Some have programs or short courses to help with study skills. However, not all institutions provide any service to help students with dyslexia.

Case Studies of Post-secondary Institutions in British Columbia

This information was collected from websites to which prospective or current students would have access.

British Columbia Institute of Technology
There is no specific information about dyslexia or learning disabilities listed on the website. There is a Disability Resource Centre; a student can request accommodations and can have an Individual Education Plan (IEP). Documentation of a disability seems more flexible than most institutions.

Camosun College
They have a Disability Resource Centre and a Writing Centre and a Learning Skills Program. English and mathematics skills are assessed to insure that students have the necessary skills or to indicate the level of academic upgrading needed. The approach is non-categorical and helpful to students.

Douglas College
There is a Centre for Students with Disabilities. The Centre helps students admission and registration procedures and with access to reasonable accommodations. Requirements for documentation of a learning disability rigidly follow the AHEAD Guidelines.

Emily Carr Institute of Art and Design
There is no specific information about dyslexia or learning disabilities listed on the website. No Disability Resource Centre is listed on the website. There is a Writing Centre to help students with writing skills.

Langara College
There is a Disability service Coordinator and a Special Needs Coordinator. There is a Math Activity Centre and a Writing Centre. Documentation, not more than 3 years old, must be provided for a student with dyslexia or other learning disability to get service. The documentation that is required must follow the AHEAD Guidelines and is quite rigid. There are some bursary awards for students with disabilities.

University of British Columbia
There is a Disability Resource Centre that follows the AHEAD Guidelines rigidly. Students will not receive accommodations unless they provide documentation. The students must pay for the assessment out of their own funds and an IQ test is required.

University of Northern British Columbia
They have a Learning Disability and Study Skills specialist and a Learning Skills Centre to help students with reading, writing and mathematics. The requirement for documentation of the learning disability follows the AHEAD

Guidelines. /furthermore, a 2 standard deviation discrepancy between IQ and achievement is required, or in some cases, between 1 and 2 standard deviation discrepancy “where an individual’s performance may have been compromised by an associated disorder in cognitive processing, a co-morbid mental disorder or general medical condition, or the individual’s ethnic or cultural background.”

University of Victoria
The definition of a learning disability requires the administration of an IQ test. The requirements for documentation of a learning disability rigidly follow the AHEAD Guidelines.

There is a Studying and Learning Skill Centre and individual learning counselling for students with learning disabilities.

The UVic Learning Skills Program helps students develop efficient learning skills and methods and higher level thinking skills. They also present workshops.

Accommodations

The Disability Resource Centre at each institution is designed to help students receive the accommodations that are needed.

There are a number of accommodations that are necessary for students with dyslexia. It is important that students with dyslexia be provided with the appropriate accommodations. Some individuals will have difficulties with written output. Copying from the blackboard is difficult and alternatives should be considered such as class handouts, photocopying assignments or other students’ notes.

The tape recorder is another alternative that provides an efficient way to record a lecture. .

Many individuals with dyslexia will be very slow in writing and will experience difficulties when written work is required. An alternative method to produce a written work will be the use of voice recognition software. This software translates the individual’s voice to a written typed output. After a short training period, the individual with LD can use voice recognition software to produce most of his or her written output.

Individuals who experience difficulties with written output should be given sufficient time to complete written work after the allotted time.

Another option for individuals, who have difficulties with writing, is learning keyboarding skills. Students with dyslexia can use their keyboarding skills in

class to take notes by using the class computer or personal laptop, as well as typing papers and work that needs to be submitted in a written way. When written work is most often required, students with LD may not be able to communicate their ideas in a written output effectively. However, if they have alternative ways to express ideas, they will not be penalized for their writing difficulties.

Most if not all dyslexics have difficulties with written work. It is recommended that these individuals use a computer (word processor) for written work. This may help improve the quality of written work. Using a computer spell check often and early in the writing process will insure correct spellings of words and can contribute to an enhanced knowledge of common word patterns. Because of spelling difficulties, consideration should be given to not reducing grades for spelling errors.

Especially in post-secondary institutions schools, there is an increasing demand for intensive reading. Student with dyslexia will find it very frustrating to try and comprehend and remember a text at the same time, as they need to spend cognitive resources attempting to read and decode words. Textbooks on tape (and/or screen readers) can provide students with the ability to concentrate on the comprehension of the text, as well as a more enjoyable experience of reading. Another advantage of using textbooks on tape or screen readers is that the students can be more independent as opposed to having an adult or tutor reading the required text to them.

In regard to examinations, there are some important issues for dyslexics. One of the most important one for the dyslexic student is extra time to complete examinations. This must be negotiated with the instructor of each course and some instructors are reluctant to grant extra time.

If acceptable to the instructor, answers to essay questions should be completed in point form. Consideration should be given to a similar format for class assignments

Arithmetic knowledge should be judged both in terms of written knowledge and conceptual abilities. It is recommended that individuals with arithmetic difficulties use a calculator. These individuals usually have short-term memory problems, and they often arrive at an incorrect answer, even though they used the correct operation. The use of the calculator provides these individuals with the ability to show their conceptual skills without errors due to short-term memory lapses.

Learning strategies to improve functioning for reading comprehension, spelling and arithmetic are recommended for students with dyslexia. For example, planning self-monitoring strategies to organize information and to avoid confusion when doing more than one activity. Other strategies could

include drawing plans or making lists to follow sequential steps from manual or verbal instructions.

The following additional recommendations should be also considered for post-secondary students with dyslexia:

- Teaching metacognitive strategies to help individuals with dyslexia may enhance their
- Encouragement of self-monitoring strategies to organize information and to avoid confusion when doing more than one activity. Strategies could include drawing plans or making lists to follow sequential steps from manual or verbal instructions.
- A literacy program and basic skills training in reading and arithmetic is a possibility for some individuals functioning at a very low level.
- Teaching people with learning disorders to make it clear when they do not understand is important. Even asking the person what they mean or to repeat the instructions in a different way may be helpful.
- If they have difficulty understanding, training people to ask the person to repeat the instructions in a different way.
- Tape recording of lectures should be allowed and encouraged if the instructor is willing to give permission.
- Because of spelling difficulties, consideration should be given to not reducing grades for spelling errors.
- Copying from the blackboard is difficult; alternatives should be considered. For example, class handouts, photocopying other students' notes or tape recording oral lessons may be an option.
- Alternate modes of examination (e.g. oral exams) may be considered.

Summary

In Canada the system for helping university students with dyslexia is very chaotic. Many students do not receive the help that they need because post-secondary institutions are not set up to provide the necessary services. There is no systematic provision of ICT services. The documentation that is required is excessive and expensive. There is much that needs to be done to improve the system.

Denmark

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Facts about Denmark

Denmark entered the EU in 1973. It is one of the smaller countries in the EU with a total area of 43.098,29 km² and 5.387.174 million people. It is a Constitutional Monarchy and the parliamentary system is governed by representative democracy. Danish democracy has been functioning well within the framework of the Constitutional Act for more than 150 years.
The capital city is Copenhagen and the national language is Danish. The currency is Danish Crowns (DKK). In 2001 97.000 students were enrolled at the 12 universities.

Disability - definition and policy

The definition of “disability” is close to that of World Health Organisation’s (WHO). However, among policy-makers “disability” is based on the concept of the environment-based perception.

Policies in Denmark for people with disabilities are based on three principles:

- The principle of equal treatment of and equal status for disabled people,
- The principle of sector responsibility, which states that each sector of society; education, transport, employment etc. is responsible for taking the needs of disabled people into account.
- The compensation principle which states that people with reduced functional capacity should be compensated for the consequences thereof.

The Danish Disability Council was established in 1980. It is a Government-funded body made up of an equal number of representatives from disabled people (nominated by the DSI, the Danish Council of Organisations of Disabled People) and from public authorities. The Council’s tasks are to monitor the situation of disabled people in society and to act as an advisory body to Government and Parliament on issues relating to disability policy. The Council can take initiatives and propose changes in areas affecting the life of disabled people and their living conditions, and all central authorities are expected to take the Council’s advice in these matters. (www.dch.dk)

Equal Opportunities Centre for Disabled Persons collects initiates and communicates, nationally as well as internationally, the information and expertise required about the situation of disabled people and the effects of particular disabilities. Moreover, the unit is to pay attention to instances where

people with disabilities are discriminated against so that the Danish Disability Council can raise the issue with the relevant authority. (www.clh.dk)

The Danish Council of Organisations of Disabled People (DSI) has 29 national member organisations representing more than 300.000 people with disabilities in Denmark. DSI is the only Danish umbrella organisation in the disability field. The Danish Dyslexia Association is a member of The DSI. (www.handicap.dk)

Dyslexia - definition and recognition
In the national encyclopedia dyslexia is defined as follows:

“Dyslexia, severe difficulties in learning to read and write caused by a slow and inaccurate coding of letters and letter patterns into speech sounds and sound patterns. Dyslexics are particularly disabled with written words they have not seen before. Their misreadings and misspellings are often inconsistent with common letter-sound-relations, e.g. tale read as "table", or her written as "his". In 1990 seven percent Danish adults labelled themselves dyslexic, while three percent were found to read everyday texts very poorly. Dyslexia is not caused by low intelligence, visual problems, or difficulties in telling left from right. Most dyslexics are poor at segmentation of coherent speech into single speech sounds (phonemes) which correspond to letters, the basic units of written language. Thus, dyslexia often occurs in connection with other language problems (dysphasia). Symmetry between left and right upper parts of the temporal cortex of the brain has been found in cases of severe dyslexia, where left asymmetry is the normal pattern. A predisposition to dyslexia is hereditary. This is the case for the difficulties with letter-sound-conversion that are the characteristic of dyslexia as well as for the difficulties in phonemic segmentation. Most dyslexics are able to acquire some reading and spelling skills. Early, systematic language and reading instruction has proven particularly effective.”

(By Professor Carsten Elbro, Dr. Phil.. *The Great Danish Encyclopedia*,)

The education system with particular respect to university

Higher education institutions are publicly financed and State-regulated. The quality of higher education is assured by ministerial approval of new programmes and institutions, external examiners and an evaluation system. Although they have institutional autonomy, institutions must follow general regulations concerning teacher qualifications, award structures, study programmes and quality assurance.

Although private institutions can operate without any approval, they must, however, abide by an accreditation procedure to make their students eligible for state study grants.

The Danish Ministry of Education regulates almost all college sector higher education, whereas the university sector is a part of the Ministry of Science, Technology and Innovation.

Every Dane over the age of 18 is entitled to public support for his or her higher education - regardless of social standing. Tuition at Danish public educational institutions is free.

General access requirements to higher education in Denmark are 12 years of education including secondary school or comparable qualifications. 3- to 4-year vocational study programmes supplied with relevant upper secondary courses often qualify for a short cycle college programme within the same field or to some medium cycle college programmes.

Admission to several study programmes also depends on the fulfilment of specific requirements. These may either be a specific subject combination or requirements concerning the level of the subjects taken, the grades obtained, work experience etc. A numerous clauses exist for a small number of study programmes.

The Ministry of Education has described the structure of the higher educational level in Denmark.
http://eng.uvm.dk/factsheets/dvu.htm?menuid=2520

A more EU-related description is found on Eurybase.
ttp://www.eurydice.org/Eurybase/Application/frameset.asp?country=DK&language=EN

Finally the HEAG-base (Higher Education Accessibility Guide) has information about the Danish educational system from the handicapped student's point of view.
http://www.european-agency.org/heag/homepages/denmark/index_en.html

Legislation in higher education with respect to disabled/handicapped students

According to the Act of Special Educational Assistance in Higher Education (SPS) handicapped students have the right to receive the special assistance which is necessary in order for them to complete their studies. The special educational assistance is granted for the number of months equivalent to the officially stipulated time of study with a supplement of 12 months. The special

educational assistance is granted for a maximum of 70 months. This period may be prolonged. If students delay their studies beyond 12 months, they loose their eligibility to the special educational assistance. In 2002 388 dyslexic students in higher education were granted Special Educational Assistance.

It is up to the students themselves to pinpoint possible special needs for implements and to ask for exemption from the examination regulations in force.
http://www.eurydice.org/Eurybase/Application/frameset.asp?country=DK&language=EN

Very severely dyslexic students who due to their disability are not able to earn a living by having a regular student's job may be granted extra financial support during their study. For this there is a standard assessment procedure conducted at the local county centre for communication disorders.

Assessment and teacher qualifications
The assessment of the dyslexic students in higher education is generally conducted by psychologists or Special Needs teachers at the local County Centre for Communication Disorders.

The psychologists may either be clinical or educational. Traditionally, the Special Need Teacher is teacher-educated and further educated as a special teacher within the field of reading disorders or has a diploma in special education. Some Special Need Teachers have graduated from university.

Any student may turn the local centre if he or she wants a dyslexia assessment without any former visitation. The assessments are free.

Test battery
There is no common assessment procedure regarding the test battery for dyslexic students in higher education. It is a standard procedure that the identification also includes personal history of reading disorders. If the student has not previously been diagnosed dyslexic, the assessment may include cognitive tests. There are different kinds of test batteries ranging from IQ testing only to batteries including more differentiated cognitive tests.

However, it is common to include text reading, reading comprehension and reading of single words and pseudowords. Furthermore a test for spelling is given and an evaluation of written work.

To assess the prerequisites for reading phonological and sometimes also morphological awareness is tested. Different aspects of the vocabulary are

tested, particularly with respect to quality. The quality of the vocabulary and naming speed may also be included in the total test battery.

Certain memory tests may be taken; sentence span, digit span.

None of the tests are computerised

Where and when are the diagnostic assessments conducted?
The assessment is carried out at the local institution in charge of the county tuition for dyslexics. Often that is a County Centre for Communication Disorders. Most of these centres are also responsible for assessments and adjustments regarding technology to students in higher education. There is no rule as to when the assessment takes place. Some times a student at a higher education is not diagnosed dyslexic until he or she enters university or has been studying for some years. Their good compensatory skills have helped them through school and may have hidden their original problems in reading and writing not only to their environments but also to themselves.

The consequences of the assessment?
Students in higher education who have been declared dyslexic may receive Special Educational Assistance in Higher Education (SPS). This may be given in different ways e.g.:

- tape recorder/ recorder for digital books
- dictaphone
- education materials on tapes or digital media
- computer with word bank, synthetic speech or other compensatory equipment
- scanner
- reading pens
- reading pens with translation
- mini-disk
- OCR-scanning of study material or talking books
- secretary support
- study assistance

Each application will be treated individually and therefore the amount of support varies. However, many dyslexic students may receive a so called “start package” which includes a laptop with the most common software for dyslexics (e.g. synthetic speech, spell checker, dictionaries).

The dyslexic students seem to be more and more aware of the opportunity to acquire support. The number of dyslexic students granted Special Educational Assistance in Higher Education (SPS) is increasing.

Awareness amongst staff
The discussion regarding dyslexic students in higher education is concerned about inclusion. However, the discussion is not primarily led by the higher education institutions but by e.g. Education Grant and Loan Scheme Agency who is in charge of the Special Educational Assistance in Higher Education (SPS) and Equal Opportunities Centre for Disabled Persons.

Many universities do not yet regard inclusion on all levels as a high priority issue.

Technology and support

The above mentioned start package is the most common equipment to dyslexic students. When technology includes a laptop with different supporting software, it is referred to as “IT-backpack”. The type of software may differ from student to student. But essentially the backpack consists of following:

- Synthetic speech
- Word prediction program
- Text recognition program
- Dictionary
- Scanner pen
- Printer
- Flatbed scanner
- Digital recorder

The total cost for this including a laptop is approximately 2.000 Euro.

Study assistance
Special Educational Assistance in Higher Education may include study assistance. This may be conducted either by specialist teachers or by a professional within this subject. The assistance should support the student in reading the most difficult passages, pages or support him or her in writing reports etc. with the main purpose to teach how to do it.

Dyslexia in Egypt

Gad Elbeheri

The country

Located in the north east of Africa, Egypt is a constitutional republic with a total area of one million kilometre square and an estimated population of 75 million (Egyptian July 2003 census). Regarded as one of the oldest civilisations in the world and the birthplace of the first ever alphabet, Egypt is a leading Arab country and an effective major player in the Middle East region; an area of almost 300 million monolingual Arabic speakers scattered in more than twenty independent Arab states stretching from the shores of the Atlantic Ocean to the Persian Gulf and from the Taurus and Zagros mountain chains in south-west Asia, across the Mediterranean and the Sahara, into the Sahel and the East African coast.

Education

Education is highly valued amongst Egyptian nationals whose love for learning is as deep rooted as the old (recently–reopened) Bibliotheca Alexandrina (Alexandria Library). Eradicating illiteracy, education of women, raising awareness of learning disabilities are all ambitious national programmes adopted by successive Egyptian governments. Two Egyptian Nobel laureates (Literature in 1988 and Chemistry in 1999) have been successfully utilized by the authorities on a national scale within Egypt to promote education and eradicate illiteracy. The recent opening of a German and a French universities in Cairo, to follow on the footsteps of the very successful American University in Cairo (working in Egypt since 1919), are but another example of the national drive across Egypt to promote and modernise its educational system.

Education in Egypt is free at all levels and reflects a strong Arabic influence. The number of students in higher education alone in Egypt is estimated to be in excess of 2 million. This tremendous increase in the intake of students all over the country as well as the increasing awareness of the importance of literacy in Egypt have necessitated increased spending on education. With limited resources and ever-increasing ambitions of higher standards of living, most Egyptian nationals view education as a cost-effective mean to achieve desirable social change. This can generally be accomplished through the current, generous, free educational system that extends to cover post-secondary education. Almost all individuals in Egypt have access to free mainstream government education. The Ministry of Education in Egypt is responsible for education during primary, preparatory and secondary schools;

while higher and further education is the responsibility of the Egyptian Ministry of Higher Education and Scientific Research.

Basic elementary education in Egypt starts at the age of six and continues for 9 years. Children join primary school for six years and then join preparatory school for three years. These first two stages are compulsory. Those interested in continuing their education enrol thereafter in secondary school for three years before finally joining a university or a higher education institution of their choice for two, three, four and five years depending on available programmes. Educational programmes and the syllabus are all delivered in Modern Standard Arabic (MSA) apart form some specialised programmes where study in English, French and German are also mandatory.

Before discussing the incidence and prevalence of dyslexia amongst adults in Egypt and consequently proposing solutions of how Information and Communication Technology's (ICTs) applications can ultimately provide assistance and facilitate the learning process of adults Arabic speaking dyslexics, the following section identifies a number of challenges that emerge either due to the linguistically based "environmental" factors that affect the learning process for Arabic speaking Egyptian adults or due to some incorrect educational practices within the various universities in Egypt. Once these challenges are identified, and understood, it would be easier to propose solutions and suggest the way forward. (For a fuller account of the specific linguistic features of Arabic, see Elbeheri, 2004).

Challenges facing Adult dyslexics at University level in Egypt

The following observations are some of the potentially confusing linguistic features that may pose challenges for the adult dyslexic and which are closely related to both the very nature of the Arabic language and the educational practices in higher and further education institutions in Egypt:

1. The practice of not writing vowels or other orthographic signs with phonological significance makes it very difficult, even for educated Arabs to "read with complete accuracy unless they have had a thorough grounding in normative Modern Standard Arabic" (Holes 1995).

2. Although Arabic words are written in horizontal lines from right to left, Arabic numerals are written from left to right.

3. When short vowels are marked; /a/ is written with a diagonal stroke *Fathaa* over the consonant letter while /i/ is written with a diagonal stroke *Kasraa* below the consonant letter and a little hook *Damma* is used to write /u/. However, in handwriting, the two dots written above the letter /t/ for example and the two dots written below the letter /i:/ or /y/ are sometimes

joined together forming a horizontal stroke above and below these letters respectively. Therefore, there is endless possibilities for confusion over whether the diacritical markings above some Arabic graphemes are indeed diacritical markings or two dots joined together while speed writing.

4. The above problem, although only common in handwritten Arabic and is very rare in typed Arabic, becomes problematic for adult dyslexic students at Universities who tend to write notes while in lectures and/or sessions, or who sometimes borrow handwritten notes from their colleagues of lectures or sessions they missed.

5. Dots are extremely important in differentiating between large number of Arabic letters. For example, the difference between /b/, /t/, /y/, /n/ or /ө/ is in the number of dots (one, two or three) or their position (above or below the letter). Such an elaborate use of dots, one can argue, may cause some confusion for dyslexics and may impede their grapheme segmentation skills.

6. Although the relationship between Arabic phonemes and graphemes are generally close and consistent, there seems to exist an overriding inherent tendency to preserve the cursive nature of the Arabic script on the expense of its quasi-regular phonological transparency. This is generally present in highly frequent words such as function words. For example, the irregular spellings of some of the demonstrative pronouns in Arabic such as هذا (pronounced /ha:Ɵa/ but written / hƟa/).

7. The absence of capital letters in Arabic, together with the cursive nature of the script and the presence of 6 non-connecting letters represent a problem in the identification of word boundaries in Arabic. In order to avoid such a problem, the majority of Arabic letters have both a final and an isolated form which only occurs whether that letter comes at the end of a word or at the end of a word after a non-connecting letter respectively. Therefore, a string of Arabic words written on any given line will include two types of spaces and there exists two possibilities for such spaces; i.e., they are either spaces between two different words (word boundary spaces) or they are spaces within the same word (where there is a non-connecting letter in the middle of a word). Conventional written Arabic has bigger spaces between different words (to indicate word boundaries) and smaller spaces within the same word. However, the length of such spaces sometimes becomes less distinguishable in handwritten Arabic and may depend largely on the reader's knowledge of the words being read. In English, such an issue is not present as all English letters are connected in any given word and in addition, new sentences and proper names are also spelled with capital letters. Such confusion over connecting and non-connecting letters and its negative influence on the identification of word

boundaries in Arabic may result in a reduced word identification skills amongst Arabic speaking Adult dyslexics.

8. There seems to be an overriding tendency of written Arabic to preserve morphological clues over phonological transparency (A similar case to English as in the pronunciation of the verbs 'heal' and 'sign' and the pronunciation of their respective nouns of 'health' and 'signature'). This is present in the case of *Otiose Alif* (also sometimes referred to as Redundant Alif) as in (*katabu*) wherein *Alif* is not pronounced but "merely serves to indicate the verbal form". Another potentially confusing example is that of the *Alif Maqsura* (*Alif* in the shape of a *Ya*) which only occurs at the end of some words and although written like *Ya* (except that it is written without the two dots below it) is actually pronounced *Alif*. *Alif* in the shape of a *Ya* is written at the end of the word to serve a grammatical purpose; mainly to indicate that the final *Alif* in this word was not really an *Alif* in the original root of the word, but were either a *Ya* or a *Waw* or as a sign of the feminine gender in case of adjectives.

9. The existing diaglossic situation all across the Arab world generally, and in Egypt particularly, means that adults are learning to read and write a language that, although very similar to what they are speaking at home, is not entirely the same; at least is not the same language of instructions their tutors use while teaching. (for a fuller account, see Saiegh-Haddad: 2003).

10. The majority of lectures and sessions in Egyptian universities are delivered directly and very few lectures are being recorded for reviewing or note taking later on by adult university students who either can not cope with the speed of the lecturer, or who find it hard to concentrate in a large lecture hall.

11. Very few of the end of the year exams for university students in Egypt are conducted orally, and the majority of the exams are hand written. Due to the lack of awareness of dyslexia in educational circles, dyslexic adults get penalized for either their illegible handwriting or for their spelling mistakes.

12. Although course work during the academic year can be printed (typed using a word processor) and as such a use of spelling checker may prove beneficial for Arabic speaking adult dyslexics, the majority of university students in Egypt have no access to a word processor either because of lack of financial resources, the small number of available word processors in the university campuses, or the lack of appropriate training available for university students on the use of personal computers and word processors.

13. The lack of assistive technology software packages for dyslexic adults university students in Egypt in Arabic. Although, some of these software

packages have been developed to help English speaking dyslexic adults, similar software packages are not available in their local language, which limits their applicability in helping Arabic speaking adult dyslexics in Egypt.

Legislation & definitions

According to the Japanese International Cooperation Agency's Planning and Evaluation Report (1999), the definition of a 'disabled person' in the Egyptian law is "a person who needs a rehabilitation service to meet the basic needs in society due to a movement-related, sensory and/or mental impairment which brings about physical, social, economical and psychological disability". This definition is very general and its application tends to cover mainly physically disabled individuals including the deaf and blind as well as those suffering from Down's Syndrome and Autism. There is however, no legislation concerning dyslexia in particular in Egypt and there is no official definition for the term either on legal, civic, academic or governmental levels.

There is however, increasing awareness of the physically disabled individuals and in March 2004, Egypt became the first Arab country to pass a law in its Parliament that forces public and private sector employers to increase their acceptance of physically disabled individuals from the previous 5% of their work force to a new 10% with immediate effect. Law No. 39 passed in 1975 and amended in 1982 has originally imposed an employment quota of 1% of disabled persons which have been upgraded to 5% in 1982 and now to 10% in 2004.

The critical need for improvement and intervention in the legislative domain concerning higher and further education has been highlighted by the recent World Bank's decision to fund a country wide project called 'Higher Education Enhancement Project' in Egypt which started in 2002 and is due to finish in 2007. The Higher Education Enhancement Project aims at laying the foundation for improving the quality of the higher education system in Egypt, through legislative reform, institutional restructuring, and establishment of independent quality assurance mechanisms, and monitoring systems. Another critical component of the project is aimed at improving the quality, and relevance of university education, through the establishment of an information technology (IT) integrated computer, and network infrastructure, and finance in-service training to develop competencies in the application of computer technology, particularly in teaching methodologies. It is therefore fortunate that such projects are taking place and it is hoped that the application of Information Technology will increase amongst university and other higher and further education institutions in Egypt to include dyslexic and other learning disabled adults.

Assessment

According to the UNESCO Statistical Yearbook (1999), the adult literacy rate in Egypt is 66.1% males and 42.8% for females. This is an alarmingly low literacy rate particularly where females are concerned. However, the situation is definitely improving if one looks at the enrolment ratio also listed in the UNESCO statistical Yearbook (1999) which is 98% males and 88% females in primary education (net enrolment ration), 71% males and 64% females in Secondary education and 24.2% males and 15.9% females in Higher Education (gross enrolment ratio). The World Bank also quotes the following figures regarding the adult illiteracy rate (% of people aged +15):

	1980	1990	1995	2000
Male	46.3	39.6	36.5	33.4
Female	75.3	66.4	61.5	56.2

It is within this, although improving, but still alarming figures, that the relevance of dyslexia assessment becomes important amongst adult university level Egyptian dyslexics. It is unfortunate that until now, there are no formal assessment procedures for adult dyslexic individuals at university levels in Egypt. Adult Egyptian dyslexics do not get any financial help similar to that offered to their counterparts in Europe, nor do they have access to other means of assistive technology which they critically need. Basic use of personal computers, audio recorders, software packages, spelling checkers and other assistive technologies are at best rare if not non-existent.

The lack of awareness on dyslexia in Egypt has resulted in the lack of qualified individuals who can carry out diagnostic assessment, apart from the lack of diagnostic assessment tools on dyslexia generally. There are no funds for assessment available, despite the availability of various cognitive and attainment tests which have been either translated (such as the Stanford-Binet Intelligence Scale or Wechsler Intelligence Scales) or developed and standardized on the Egyptian environment. An attempt was made to develop a dyslexia screening tool (Elbeheri, 2004) for children, but this needs development and is not commercially available yet. However, there is a positive move to conduct similar studies on dyslexia in Arabic.

Funding and Support

Although the Egyptian Ministry of Education provides special education services for children with disabilities, such services are only for the visually, hearing and mentally impaired individuals through 165 specialised schools and a further 204 schools containing one or more specialised classroom for individuals with disabilities. Despite the government of Egypt placing high priority on disability, with both governmental and non-governmental organizations working together to tackle disability issues, the Egyptian Central

Authority for Public Mobilizations and Statistics estimates the total number of individuals with disabilities (according to the definition presented earlier) to be in excess of 2 million individuals and the current services offered by governmental and non-governmental organization to only cover 10 % of the total number of persons with disabilities.

There are no funding or support available for adult dyslexics at the university level in Egypt. The majority of exams at university levels are written and saturated in verbal instructions and are generally unfriendly to dyslexic individuals. There are no disability allowance for adults with dyslexia and no academic or counselling support either. Besides, exam provisions are only available to physical and severely learning disabled individuals. No such provisions are available to mild or 'invisible' learning difficulties or dyslexia. There are no current adult provision for dyslexics available in Egypt.

Teacher Training

So far, there is no available formal teacher training directed specifically at dealing with dyslexia in Egypt, although, during professional initial training at university level for student teachers, the topic of learning disabilities is amply discussed. Student teachers at university levels in Egypt; i.e., mainly those graduating from the Faculty of Education which is a major component of nearly every university in Egypt, do not come across the issue of dyslexia. Knowledge of 'learning difficulties and/or disabilities' is rather general and is always described with little details. There are no specialized centres available to offer a qualified teacher training service for special educational needs teachers.

Assistive Technology

There is no assistive technology software available for adults with dyslexia at university level in Egypt. Despite the availability of tape recorders, advanced audio and video equipments as well as computers (both desktops and laptops), word processors and internet access, only very few university students use them due to the high number of users and the low number of available equipments. These problems are particularly apparent in disadvantaged and poorer areas such as Upper Egypt. In additions, most of the technology available at university can not be taken home and are only permitted for use on the university's main campus.

There are no text to speech software available for monolingual Arabic users. There are no dedicated spelling checks programmes (apart from the Arabic version of Microsoft Windows with its inclusive spell checkers). Other useful assistive technology software such as concept and mind mapping are not available in Arabic. Thanks to the Minerva project, ideas of making such tools available to monolingual Arabic speakers have been discussed and the ease

and functionality of their technical applications have been covered and it became apparent that these can be developed in Arabic. However, funding is critically needed for developing these tools in Arabic.

Advocacy groups

There are no specific groups or organizations dedicated to the study or research on dyslexia in Egypt, despite recent active movements within academic, societal and educational settings regarding special education and learning disability. The latest Regional Conference on Education For All: Arab Vision for the Future was held in Cairo between 1-3 June 2004 and was organized by the UNESCO offices in Cairo. The Conference addressed the issues of quality of education as well as means of modernizing and reforming the education system with a list of recommendations that included the enhancement of the use of Assistive Technology to help increase the quality and delivery of better education for Egyptians. Therefore, despite the lack of adequate number of advocacy groups, there still seems to be a nationwide interest in raising awareness of education and special needs by organizing large scale conferences and seminars to address critical issues pertaining to education in Egypt.

There is a newly established centre called the Egyptian Learning Disability Association (ELDA) in Cairo which is dedicated to the study of learning disabilities in Egypt. The centre, although looks at the whole issues of learning disabilities and as such have a wide remit, has recently attempted to formalize links with international research bodies by attending the latest British Dyslexia Association's 6th International Conference, 2004. ELDA held the first ever international conference on dyslexia to be held in Egypt "Reading & Writing Difficulties in Cairo in February 2005.

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France

L Sprenger-Charolles

Dyslexia and computers in higher education in France - What are the barriers to learning for dyslexic adults, and how could information technology assist them?

1.Who has the authority to make assessment? (All ages)
Speech therapists and physicians (pediatricians, psychiatrist…).

2. What tools are used to identify dyslexia? (Computerised and otherwise)
Mainly Alouette (Lefavrais) which provides a reading level from 5.11 to above 14.3 years of reading age. The children have to read aloud a 265-word text as quickly and accurately as possible. The text includes rare words (e.g. 'arrimé' meaning 'stowed'), words with similar pronunciation (e.g. 'Annie-amie' /ani-ami/), as well as words with contextual graphemes (e.g. 'gai-geai' /ge-□e/). It also attempts to use foils for set phrases ('au clair de lune' instead of the usual 'au clair de la lune') or expected words (e.g. 'cordeau', meaning 'gardener's line', after 'moineau', meaning 'sparrow', instead of the expected 'corbeau', meaning 'crow'). Errors and reading time are recorded while the child is reading. The child is stopped after three minutes. The reading level is obtained either from the reading time (when less than three minutes) or from the number of words read in three minutes, with points deducted for each error in both cases. This reading level is then transformed into a standardized reading age.

Word and pseudoword reading aloud tasks: BELEC (from ULB, not computerized)

The sole computerized tests are the one developed in our lab (EVALEC). This test included:
-Reading aloud tasks (short and long words and pseudowords, regular and irregular words...): a specific computerized program records the responses and time latencies are automatically computed via the speech signal
-Silent reading tasks (mainly orthographic choice task)
-Phonemic awareness
-Phonological short term memory...
.

3. What assessment is made of the difficulties, and how that is matched to needs? What software is available? See above

4. What funding is available to students? (From government, foundations, private souces, for computers, special tutors etc.)

There is no such funding, except if dyslexics are classified as very severely handicapped (the notion of handicap being mainly up to now for people mentally or physically handicapped).

5. What legislation (eg disability rights) support exists, including appeals procedure?
There are two commissions for people with special needs, one for children, the other for adults
These commissions are mainly for people with severe handicaps (physical or mental) and not very aware of the special needs of the dyslexics.
and the laws that can help them are not very clear, for instance:
Circulaire du (...) Circulaire n° 2002-024 du 31-1-2002 - B.O. n° 6 du 7-2-2002 (Encart)

6. What support services are in place?
Starting from two years ago, dyslexics can be sent to a specific 'centre de ressource', mainly in a hospital (with a pediatrician or a neurologist at its head). These center can make a diagnosis. Some of these centers included special classes where the children received training (with special school teacher and speech therapists).

7. How are support services publicised (institutionally and nationally)?
Nothing at the level of institutions

8. What are the institutional policies (national and local) on technological aids?
Up to now, there are no institutional policies for technological aids.

9. What is the variability of dyslexia support within any one institution?
There is no support for dyslexics in higher education except if they are classified as very severely handicapped.

10. What level of funding is available to students?
There are no fundings for dyslexic children (see here above).

11. What training is available for tutors to ensure dyslexia friendly delivery?
There is no training for teaching dyslexics for teachers in higher education.

12. What software is available to help the older dyslexic:

Mind mapping	*not available*
Text to speech	*nothing to my knowledge*
Speech to text	*nothing to my knowledge*
Spell checkers	*yes (microsoft word)*
Grammar checkers	*yes (microsoft word)*

13. What software is available to help the younger dyslexic?
There are some teaching software, but they are very rarely used for dyslexic children.
For instance, an US company, Leapfrog, is developing a training program in French for reading acquisition (text and speech).

14. Are there web sites to support them?
There is no governmental support for dyslexics through internet.

15. What percentage of dyslexics are at university?
There are no data available.

16. What are the barriers to dyslexics being at university (eg the need to pass exams in a first or second language
There are no support services at the universities.

17. What is the relative cost of

Computers	*around 1200-1500€ and for a laptop 2300€*
Tape recorders	*it depends on their quality*

18. Do lecturers allow tape recorders to be used in lectures? Yes.

19. Are handouts generally provided? Rather occasionally.

20. How many dyslexic individuals were surveyed?
These responses are with respect to our centre, which sees 1000 dyslexics and SLI each year. 36 are in the special school of the Centre (dyslexics and SLI).

Dyslexia and the Greek educational system

Based on information provided by Helen Kyratji

Education in Greece is largely the responsibility of the State.
Greek education, especially at secondary level, has to a great extent been oriented towards general education with emphasis on preparing students to enter higher institutions rather than helping them to acquire marketable skills (OECD, 1997).

Oral examinations are the only legally and educationally recognized provision offered to learning disabled students (including those with dyslexia) according to the Law 2525 of 1997.

Centres of Assessment

The mains centres concerned with the identification of the dyslexic individual are:

Medico-pedagogical Centers
Centers of Psychological Health

Methods of Assessment

There are many tests that are used for the identification of the dyslexic individual. Some of the most common ones include:
Wechsler Intelligence Scale (standardized for the Greek sample).
Non-standardised tests of reading, spelling and arithmetic.
Porpodas (University of Patras) DITT Language Pack (EU funded).
Pavlidis (University of SALONICA) eye movement screening dyslexia test (widely used in USA).
CNIT (Cyprus) MAPS – (Mental Attributes Profiling System).
Kyratji Cognitive Profiles test, Phonological awareness, phonological output, Neale reading analysis test (adapted to the Greek context)-in progress.

Findings

- Only the last two decades the Greek Education System paid attention to the special educational needs of dyslexic pupils.
- The issue of identification of children with dyslexia is problematic in Greece.
- General awareness of dyslexia is rather limited within the Universities (only 17.5% acknowledge its existence) and much has to be done to raise awareness among tutors and students. Certain tutors at the Education and Psychology Departments are often the main providers of information about dyslexia within the institutions.

Generally, the assessment centers are not fully staffed with specialized personnel and it is the child psychiatrist or psychologist who usually make the diagnosis of dyslexia. As far as psychometric tests are concerned, the Wechsler Intelligence Scale for Children (WISC-III) is widely used and it is

standardized in a Greek sample. Non-standardized tests of reading, spelling and arithmetic are also given to children to test their attainment of basic skills.

Prevalence of dyslexia in university

The number of Greek dyslexic students: a study by Stampoltzis and Papadopoulos 2002
Table 1: Number (and percentage) of pupils with dyslexia who enter higher education (Technological Educational Institutes and Universities)

Students entering higher education (2000-2001)	3676
Students with dyslexia entering higher education	69 (1.9%)
Students with dyslexia entering higher education by sex	Boys 48 (1.3%)
	Girls 21 (0.6%)
Students with dyslexia entering T.E.I	52 (2.9%)
Students with dyslexia entering T.E.I by sex	Boys 35 (2.0%)
	Girls 17 (0.9%)

- The 63.1% of Technological Educational Institutions have a general policy on examination arrangements for dyslexic students
- Only 20.6% of Universities have dealt with the issue
- 50.5% of the Technological Educational Institutions have received some kind of information about dyslexia either by the Ministry of Education or by the students themselves
- The incidence of dyslexia in the Higher Education is 0.18%
- Technological Educational Institutions have almost four times more dyslexic students than Universities (0.3% vs 0.08%).
- The 16.1% of Greek Higher Education Institutions claim to have students with dyslexia-related difficulties but do not submit a formal assessment and therefore do not enjoy any special provision.
- Only the 12.5% of GHEI reported that they have a tutor who assists students with dyslexia.

A. Stampoltzis, Special Diagnostic and Therapeutic Unit "SPYROS DOXIADIS".
S. Polychronopoulou, University of Athens, Department of Primary Education.
A. Papadopoulos, Centre for Educational Research.

Hong Kong

Ian Smythe and Alice Lai

About Hong Kong

Hong Kong is technically know as the Hong Kong Special Administrative Region (Hong Kong SAR) and was granted 50 years of independence (a high degree of autonomy) from China at the time of the returned to the Chinese government from Britain in 1997. The area of Hong Kong is approximately 150 square miles, and has a population of around 6 million. There are around 50,000 students enrolled at the 5 universities. There is a strong tradition of lifelong learning in Hong Kong, and as a consequence, many students attend course late into the night having worked all day. As well as 50,000 full time students at university, there are further 100,000 part time students in higher education.

Languages

The official languages of Hong Kong are Chinese (Cantonese) and English. However, of the six million who live in Hong Kong, less than 100,000 have English as their first language. Due to the high numbers of "immigrants" entering from mainland China, Putonghua (Mandarin) is heard increasingly on the streets of Hong Kong. However, only a few schools use Putonghua as the medium of instruction.

Disability legislation

Below are a series of paragraphs from the Disability Discrimination Ordinance Code of Practice on Education which are particularly relevant to SpLD, and highlight the legislation that pertains to the most important issues. Despite three years since the introduction of this legislation which puts pressure on the institution to accommodate and the government to provide funding, there is little in the way of positive implementation.

The need for the institution to make accommodations for the dyslexic student comes under:

12.2.1 Accommodations are measures or actions taken in order to provide equal opportunities for students with disabilities, such as the provision of aids, facilities or services to meet his or her individual needs. A detailed assessment may be required in order to determine what accommodations are necessary and each case needs to be considered with regard to its own circumstances.

12.2.2 Educational establishments have the obligation to make reasonable accommodations in their existing programmes, services, facilities and benefits in order to meet the needs of their students, or prospective students with disabilities …

12.2.3 The type and extent of accommodation may vary depending on the individual and specific requirements of the student and other relevant circumstances. Multiple accommodations may be required and may

include multiple activities. In determining what accommodations are to be made, the following factors and circumstances should be considered:

12.2.3.1 the accommodations are reasonable for the purpose; that is, they reasonably fulfill the educational and training needs of the student;

12.2.3.2 the accommodations are focused on enhanced student independence;

The need for educational institutions to ensure all parts of the curriculum are accessible to the dyslexic student is covered by:

14.4 Educational establishments should actively observe whether students with disabilities have difficulty in following the curriculum because of their disabilities. If so, accommodation should be considered in the form of tailoring the curriculum to meet the individual needs of the student with disability concerned. This means that the content of and the teaching methods used in some of the subjects studied by the particular student may need to be adjusted. A tailored curriculum should enable students with disabilities to achieve the objective of the curriculum more easily without necessarily lowering its standard..

Examination provision for the dyslexic student is covered by:

17.1 Educational establishments should ensure that their assessment mechanisms do not discriminate against students with disabilities. Teachers are advised to use a number of assessment methods in order to allow students, including those with disabilities, to display their competencies.

17.3 Educational establishments should critically review their assessment methods adopted to ensure that they serve the purpose of the assessment. If the purpose is to assist students to appreciate their progress and identify future learning needs, more individualized instead of standardised methods should be adopted.

The roles and responsibilities for government funding are covered by:

22.1 The DDO is binding on the Government. Government should develop appropriate policies and deploy reasonable resources to support equal opportunities for persons with disabilities in all aspects of education.

University staff training in dyslexia issues is covered under:

22.2.2 (The university should ensure) reasonably adequate training programmes are made available to teachers to enhance their understanding of the needs of students with disabilities, and equip them with professional knowledge in adjusting teaching strategies;

23.2.6 educational establishment should facilitate staff training which supports teachers and other personnel in meeting the needs of students with disabilities;

The development of dyslexia resource centres and campus wide assistive technology for the dyslexic individual is covered under:

22.3 The Government should allocate reasonable resources to facilitate educational establishments having students with disabilities or planning to admit such students to modify their premises or acquire the necessary services or facilities to enable such students to study in the educational establishments.

The need for educational establishments to ensure equal opportunity is covered by:

23.2 Educational establishments have a responsibility to ensure that persons with disabilities have equal opportunities to a quality education and the following strategies should be developed:

23.2.5 educational establishment should allocate resources in a way that does not discriminate against students with disabilities;

Entrance qualifications for Universities in Hong Kong

In Hong Kong universities the main language of instruction is Cantonese and English. In addition, many subject make extensive use of English language based course books. For this reason, all universities in Hong Kong insist on good English language skills before a student is given a place. However, the very nature of the difficulties of the dyslexic student means that this qualification is a barrier for dyslexics entering university. The introduction of the Disability Discrimination Ordinance will lead universities to have to reconsider their position, since they may be adopting illegal practices if it is decided that students are being assessed on criteria that are not important for the subject. This is not only with respect to entrance qualifications, but also to examinations. For example, a student of Fine Art should be able to prepare a thesis in Chinese since the course should be assessing their ability in the field of fine art, and not assessing their disability in a language skill not pertinent to the qualification.

As a consequence, many dyslexic students have to go to overseas universities in order to obtain degrees, for instance in the UK and the USA! Although there have been no test cases, it has been argued that since these individuals have been able to obtain their degrees, and given than the degree standards are broadly similar, it would be fair to argue the Hong Kong system has been discriminatory. Therefore the fees for sending a student abroad for a degree should be recoverable from the government.

Screening, assessments and adult dyslexia student

At the time of writing there is no formal series of tests to identify the needs of the dyslexic student. Furthermore, there is no support in terms of accommodations that is made available.

However, Dr Alice Lai of Hong Kong Polytechnic University is leading a team to develop a series of tests to overcome the shortage. There tests are designed to identify the dyslexic respect to the working definition used by the Education and Manpower Bureau (Lee, 2004).

> *Dyslexia is a severe and persistent difficulty in the acquisition of reading (word recognition) and dictation /spelling skills.*

To this, the developers have added the specific dimensions of fluency and accuracy to ensure both concepts are included.

Therefore in order to identify the dyslexic adult it is necessary to demonstrate difficulties with:

Single word recognition – fluency and accuracy
Reading prose – fluency and accuracy
Reading comprehension – fluency and accuracy
Pseudocharacter – fluency and accuracy
Dictation/Spelling – fluency and accuracy
Independent writing – quality, fluency and accuracy.

Although the traditional approach is to use their educational history as a marker for the “acquisition” components, there is an attempt to develop a computerised test of “ability to acquire”. This approach was developed by Smythe and Siegel.

Software

Chinese keyboards, keyboard skills and touch typing

One of the major difficulties of the Chinese dyslexic student is the keyboard, and entering the Chinese characters. By the time they enter university, the student is expected to know as many as 10,000 characters. To reproduce each of those characters can take 2-4 keystrokes. If there is an error, the student will be expected to know which of the alternative shown is correct. Unfortunately, unlike in an alphabetic script, there is no clue as to the meaning of the alternatives offered. However, some software will read out what you have typed. While the primary school student is often introduced to keyboard skills in an alphabetic script, in Chinese the student is only expected to know the principles of typing by the time they leave secondary school. Increasingly secondary students, and even primary students, know Chinese input methods because it is required for their ICQ chats. At Secondary schools, most schools give structured instruction in Chinese input method. I think your statement is incorrect.

There is, however, a second method of character input which uses a small pad and stylus. The required character is written by hand using a small pad

and stylus. This greatly facilitates the character entry and it reduces the memory load of having to recall the entry codes for individual characters. However, the student with handwriting difficulties may require a lot of practice before the system can recognise their characters, particularly if they have dyspraxic tendencies.

There are a number of software packages in Hong Kong which offer typing skills.

Word Processing
The word processing package of preference is Microsoft Word. There are Cantonese and Putonghua versions of this software.

Grammar checkers and spell checkers
Due to the high number of homophones, it is very difficult to develop "spellchechers" and grammar checkers for the Chinese language. They are not part of the standard Microsoft Word.

Concept mapping
The difficulty of using the keyboard makes the use of concept mapping tools problematic. However, recently trials have begun with MindFull which includes a simple drawing package. This allows the Chinese characters to be entered as images.

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Text to speech
There are a number of text to speech programs around which offer good capability to read text from the screen.

Speech to text
Speech to text is considerably more complex in Chinese than in alphabetic languages due to the very high level of homophones. That is, the computer has to listen to a considerably larger chunk of spoken language in order to disambiguate the homophones. Although currently far less sophisticated than the alphabetic equivalents, considerable progress has been made in the last two years, and dyslexic Chinese students are beginning to use them. However, making corrections is still very difficult.

Auto translation
The high use of English in the university environment means there is a considerable desire to have software which will aid the "translation" of Chinese into English and English into Chinese. Simple versions of this are already available, but not widely used by the dyslexic community.

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Hungary – an overview of provision

Éva Gyarmathy

Hungary and Hungarian language

Hungary, officially called Republic of Hungary, is located in Central Europe, in the Carpathian Basin surrounded by the Carpathians, the Alps and the Dinara Mountains. The territory of the country is 93,030 square kilometres, covering about 1 per cent of Europe. The population is about 10 million persons. Hungary is a member of the EU. The Hungarian capital is Budapest where about 15 °% of the population of the country lives.

The Hungarian language is usually classified as Finno-Ugric. There are various alternative theories about the origins of Hungarian, but these are dismissed by most linguists owing to a lack of evidence.

Hungarian is spoken in Hungary and in certain areas of Romania, Slovakia, the Ukraine, Serbia, Croatia, Austria, Slovenia, all of which territories used to belong to Hungary. There are all together about 14 million speakers of Hungarian. The Hungarian name for the language is *Magyar*.

Hungarian pronunciation can mostly be predicted from the written language. (Wikipedia, http://en.wikipedia.org/wiki/Hungarian_language)
Hungarian language is basically agglutinative, i.e. grammatical relations are expressed by means of affixes. "This means that endings are attached to words in a neat and prescribed order, and words can grow to stunning lengths. There are no prepositions, and very few auxiliary verbs. For example, *hajthatatlanságunktól* means "*from our inflexibility*", and is structured hajt-hat-atlan-ság-unk-tól, each element in turn expressing the verb, the possibility, the negativity, the possession, the preposition ("bend-can-not-ness-our-from"). And all this happens very regularly, indeed mechanically." (Ádám Nádasdy, http://www.filolog.com/languageStrangeCake.html)

Children with specific learning difficulties

An estimated 10 % of students suffer from specific learning difficulties (dyslexia, dysgraphia, dyscalculia) in Hungary, and the number of these students identified is gradually increasing. Due to lack of standardized procedures for identifying these children, more precise data are not available.

There are special classes and schools for children with specific learning difficulties. In more serious cases, special need teachers or speech therapists do identification and therapy individually or in small groups to treat dyslexia and other types of specific learning difficulties.

More and more specialists agree that dyslexia is not a disease, not an illness that can be cured. Dyslexia is a specific way of thinking, which is disadvantageous in acquiring some abilities and skills, especially ones that

are essential in the academic achievements. Thus the school years for dyslexic children can be a nightmare. Despite their average or even above average intelligence, dyslexic children cannot read, write, count and study like others. They need special help.

One could assume that after the dyslexic person is over the difficult years of schooling, later, at least after finishing education, their life gets easier. However, this is not the case.

Adult dyslexics

In Hungary, most of the dyslexic adults, especially those above forty do not know what cause lies behind their difficulties. The syndrome now called dyslexia or specific learning difficulties is rather new. Some decades ago, children, who were not able to learn to read, write or count were considered mentally disabled or perhaps, at best, lazy, good-for-nothing children.

Either diagnosed or not, a dyslexic adult with much anxiety and low self-esteem will grow up from a dyslexic child. Undiagnosed dyslexics struggle with their difficulties without knowing what is wrong with them. Bright dyslexics can compensate well for their weaknesses, but often find that various easy tasks, like filling in a form is ludicrously difficult for them, while others solve it easily. Identified dyslexics are stigmatized. Dyslexia is still believed to be a mental problem, and most of the dyslexics and their relatives feel shame about it. Diagnosed or not, dyslexic adults have hardly any professional support.

Dyslexics are often in trouble in finding a proper job. As Hungarian is a rather rare language, for most of the higher level jobs command of a foreign language is a requirement. In Hungary, foreign language teaching is very academic, thus hardly accessible for dyslexics. According to the law, identified dyslexics are exempt from learning foreign languages. Consequently, those who need a foreign language exam later, have to learn it as an adult at great expense.

At the university

Many dyslexic people can get to university despite their severe learning difficulties. Fortunately, at the university level, their specific abilities can be advantageous, too, therefore, they can be very successful. However, written exams, long essays to write and bulky books to read are a serious challenge for dyslexic students.

Dyslexic students receive no official support at any Hungarian universities. There are no services for them to provide practical help for their studies.

The main problem dyslexic university students face is the foreign language exams. In Hungary, a university degree can only be given to those who

achieve an at least intermediate language exam. Sometimes it is an insurmountable obstacle, and after years of hard work at the university, the student cannot get the degree for many years or forever.

Assessment and provision

In Hungary, there is no standard test for identifying dyslexia in childhood. There are more and more methods that are used in different institutions, but neither of them is accepted in a wider specialist circle or officially used to identify dyslexia. Thus it is no surprise that there is no measure for adult dyslexia. Most of the specialists for dyslexia are convinced that dyslexia cannot be diagnosed after age twelve.

At the Research Institute for Psychology of the Hungarian Academy of Sciences we started a programme for adult dyslexics. A self-assessment questionnaire was developed and published for use on the internet (www.diszelxia.hu and www.lelekbenotthon.hu). On these sites, adult dyslexics may obtain information and counselling, as well.

We launched courses for teachers on understanding dyslexia, and we have special courses for teachers teaching English as a foreign language. Teachers can learn methods how to teach a foreign language to dyslexics. We plan to run such courses on different languages after we find appropriate material. Next year, a language school will open for dyslexic adults.

Legislation

As adult dyslexia in essence hardly exists either on the lay or even on the official level, very few laws deal with it. Legislators concentrated only on the education of dyslexics.

Dyslexic persons who are identified officially as dyslexics get extra time for written exams on the final exam finishing secondary education and their spelling is not assessed. Similarly, dyslexics receive dispensation from written exams in foreign languages, and in serious cases are totally exempt from them.

Another problem is to get a university degree. As noted above, in Hungary, one can only get a degree if one holds both oral and written exams from at least one foreign language. However, the law allows for dyslexics to having to pass either only the written or the oral exam.

Dyslexia is usually diagnosed in the childhood. Their are official institutions where speech therapists, special need educators and psychologists assess dyslexia. If somebody wishes to get a dispensation after age 18, a medical expert has to decide in their case.

Associations
Since dyslexia is considered as a problem belonging to the school years, even specialists finish dealing with dyslexics after the obligatory school years. There are two dyslexia associations and several foundations for dyslexics in Hungary. However, they concentrate on dyslexic children and their parents, and do not follow the problem in the adulthood. Adults have practically no organized support for their difficulties caused by dyslexia.

More and more results of research studies show that, compared to the average population, there are at least twice as many dyslexics among those suffering from mental disorders (especially mood, anxiety and somatoform disorders). We are going to organize self-support groups for adult dyslexics, and, hopefully, it is going to form the basis of an effective association for dyslexic adults.

Additional information

Who has the authority to make assessment? (All ages)
Psychologists, speech therapists and special need teachers assess dyslexic children, however there are special institutions to assess dyslexic children to get any official help, such as increased fee for the school where they learn, relief from learning languages and lightened exams.

What tools are used to identify dyslexia? (Computerised and otherwise)
Many tests are used including Bender, Frostig, Inizan, Sindelar, Meixner vocabulary test, Gósy GMP linguistic ability test, Dyslexia Prevention Test (DPT), Kassai and Kovács verbal memory test.The test measures senso-motor skills, auditory discrimination, auditory memory, spatial orientation, visuality, sense of rhyming, fine movement and drawing abilities. (Last year the Hungarian adaptation of NEPSY has been developed for research use.) Test are not computerised.

What assessment is made of the difficulties, and how that is matched to needs? What software is available?
There are no computerised versions of the tests yet.

What funding is available to students? (From government, foundations, private sources, for computers, special tutors etc.)
There are no such funding.

What legislation (eg disability rights) support exists, including appeals procedure?
Dyslexic children were listed as handicapped students thus schools receive extra financial support for these children. A head teacher can exempt the child with specific learning difficulties from problematic subjects. Similarly, these

students are allowed to choose another subject instead of the problematic one for the final examination in the Hungarian secondary school.

What support services are in place?
There are some official institutions for support, but these are usually for seriously dyslexic children. Many from the district councelling services have specialist to deal with dyslexic children. There are more and more private remediation services for children, but not for adults..

How are support services publicised (institutionally and nationally)?
It is a basic problem that parents don't know about support possibilities. There is no official publicity for such services, however there are more associations for dyslexic children, and more web pages to provide information for dyslexics and there parents and teachers.

What are the institutional policies (national and local) on technological aids?
There is no institutional policy for technological aids.

What is the variability of dyslexia support within any one institution?
There is no support for dyslexics in higher education.

What level of funding is available to students?
There are no fundind for dyslexic children.

What is the take up level of this funding, and what determines take up levels?

What training is available for tutors to ensure dyslexia friendly delivery?
There is no training on teaching dyslexics for teachers in higher education.

What software is available to help the older dyslexic:

Mind mapping	*Yes*
Text to speech	*Yes*
Speech to text	*Yes*
Spell checkers	*Yes*
Grammar checkers	*Yes*

What software is available to help the younger dyslexic?
There are some word teaching software, but they are very rarely used for helping dyslexic children due to lack of knowledge of their existence, and the lack of availability of computers in the classroom.

Are there web sites to support them?
There is no government support for dyslexics through internet.
Non governmental websites include www.diszlexia.hu

What percentage of dyslexics are at university?
There are no data on it.

What are the barriers to dyslexics being at university (eg the need to pass exams in a first or second language, or general lack of support from early on)?
Dyslexia is considered still widely as a mental deficit, and dyslexic children are very disadvantaged in the school. Thus many even from the bright dyslexics cannot be accepted into higher education. The second language as a criteria for university degree is another problem, as the language teaching is very old fashioned and bad for dyslexics. Beyond these drawbacks there are no support services at the universities. Thus even when a dyslexic individual can reach university, the studying presents many problem for which there is no official support.

What are the problems in the language that technology could address?
There are very long words and expressions in Hungarian, so to make notes of a lecture takes a very long time for dyslexic thus it is practically impossible for them to follow the lectures. Tape recorder could help in it. Computers can help to write essays and create Mind Maps or any visual material.

What is the relative cost of

Computers	*1500 – 3000 euros*
Tape recorders	*50 – 100 euros*

Do lecturers allow tape recorders to be used in lectures?
Yes.

Are handouts generally provided?
Rather occasionally.

Which institutions/suppliers have been contacted to verify the above?
Two schools for special need children, three universities, Ministry of Education, some shops for technical devices.

How effective is the software?
In the survey, most dyslexics responded that they did not feel competent to judge the “effectiveness” of each software package, since there were no comparisons. However, it was noted that if they were trained correctly, most felt that the software had more benefits than disadvantages, and continued to use it. This suggests that for the intended purpose, the software must have been effective, though this does not mean it could not be improved. However, some noted that in English it is possible to compare similar packages, and have a greater understanding of their “effectiveness”. That is, they could choose the “style” that best suited their needs. For example, there is only one concept mapping tool available in Hungarian, and this was produced during the life of the project. However, the students interviewed felt that tools such as

text to speech were very good in English, but there is no voice in Hungarian. Thus although it helped with the technical books in English, the dyslexic student, who may be struggling with English language, was doubly disadvantaged as they could not use this most important tool to support their reading skills in their preferred language. Furthermore, there is no Hungarian speech-to-text. Two students reported attempts to use English speech-to-text but found it dissatisfactory as the software struggled with their accents. While several English accents are provided, there is no suitable one for their needs. Consequently training was not easy, and they failed to complete it. The general consensus was that the spell checkers were accurate but you needed to be a good reader to work out the correct spelling from the list provided. Since Hungarian is a transparent language, it was often possible to read the words, but longer words (e.g. technical words and multi-morpheme words) were difficult to read fluently, a skill often necessary to get the get the meaning. While most students reported using them, they said that if the word was similar to a word in the list, they would often choose one at random. This was particularly true is the only difference was the diacritics. A spellchecker which read out loud the meanings, as is available in English, would be very useful, and improve the effectiveness. There was a general feeling from those interviewed that there was room for improvement. One possibility was to use a smaller dictionary and provide less choices, since rarely is the written vocabulary of the dyslexic student that large.

How many dyslexic individuals were surveyed?
135

Japanese Perspective
Eiko Todo

Introduction
This chapter reflects the situation with respect to the adult dyslexic individual in Japan. This subject is not widely discussed in Japan, and as a consequence, with respect to the specific areas addressed in this trans-European project, currently there is not a lot to report. However, the recent formation of the Japan Dyslexia Society has provided a focus for the development of collaborative projects, and a start to the development of resources for the dyslexic adult. Where appropriate, mention of the resources (or lack of resources) for children is also included.

Country
Japan is a democratic country with a population of 127 million. Its land is composed of four main islands and the total dimension is 377,727 sq km. Only 12% of the land is arable. Its capital is a cosmopolitan metropolis of Tokyo. The currency is yen. GDP is $4,141bn. Japanese is the national language. Literacy rate according to UNDP Human Development Index 2003 is 99.9%.

According to national statistics (2002) the school population is around 19.1million, or about 15% of the population. Of this, 7.3 million are at primary school (7-12 years old), 7.6 million at secondary and high school (11-18 years old), and a further 4.2 million at university and further studies.

There are three kinds of university: national, public and private universities. In the national and public sector, there are 176 universities and 384 colleges in Japan. There are 526 private universities and 5535 private colleges. The main centres are Tokyo-Kanto area and Osaka-Kansai area. Only universities can grant bachelors degree and it takes 4 years in general.

Legislation
Although Japan has not signed the Salamanca Declaration, the Ministry of Education has paved the way to policy development and implementation in the area of special educational needs. The Declaration highlighted that every individual “has unique characteristics, interests, abilities and learning needs” (Salamanca, 1994). However, Japanese Disability Discrimination law only deal with the more “traditional” disabilities of physical disabilities, the deaf and the blind, without looking into the “invisible” disabilities, such as dyslexia.

Definition of dyslexia
The term LD (learning disabilities) is generally used to cover dyslexia and the use of word dyslexia was limited to medical use. Recently there are coverage on newspapers and TV programs on dyslexia.

Assessment
At present, there is no specific test or battery of tests for identifying dyslexia in Japan for children or for adults. The tools used to identify those with dyslexia are adaptations of international tests, which are WISC III and K-ABC. There is no national standardized test for reading ability in Japan. Usually teachers will look at the hand writing, reading ability for several Kanjis (Chinese characters) and dictation of several sentences and see at what level is at compared to the child's ability shown in the IQ tests and his piers.

Although the tests undertaken show poor reading age against the norm within the school population, these tests are only based on specialists' local knowledge. There is a lack of awareness of dyslexia in Japan (no computerised testing, no statistical studies – prevalence of dyslexia not known, lack of professionals).

It is generally acknowledged that those who have taken a teaching license or professionals who are trained and then taken several days courses on using WISC and K-ABC are entitled to assess individuals. This includes classroom teachers, psychologists, speech therapists, councillors and special needs teachers. However, none of them are specialised in dyslexia and there is no training available for tutors to ensure dyslexia friendly delivery.

Now there are researchers specialising in dyslexia but few. They have a meeting once a year to exchange the findings. The members are mainly physicians and teachers. When it comes to LD, there is Japan Academy of LD with a membership of more than 3000. Most of the members are teachers who are taking courses to assess and teach LD children in their schools. On the other hand, brain science researchers are getting involved in dyslexia research.

Japan Dyslexia Society (NPO EDGE) is developing screening tool which help identify the difficulties of the dyslexic individual with advice. They may also be used for assisting in the identification of the difficulties of the dyslexic adult.

A screening test for the dyslexic Japanese adult has also been developed (Todo, 2002), based on the work of Smythe and Everatt (2001).

Support
There are no specialist institutions or schools for individuals with dyslexia. However, there are institutions for all special needs and assessment for dyslexia is usually carried out at these places. Those diagnosed as dyslexic are sent to a special school for all disabilities where they are grouped by disability, or stay in mainstream schools. There is no special provision for dyslexic adults.

At some universities (60 in 2002) have some provisions for LDs (dyslexics) at entrance examinations but after entering, it is left up to the individual to talk with the tutor for further provisions.

Funding

There is no specific funding (and therefore no support) for dyslexia under the Minister of Education. Specialist teachers and speech and language therapists work with all special needs children including those with dyslexia in public schools (computer technology is in a few classes) or in special schools (funding is available only for children who get a status of disabled) and only specialist tuition. No assistive technology support is available in vocational schools (15-18yrs).

There is no research as to how adults and university students cope. The technology is home based and no financial support is available.

Technology and support

With Japanese high-tech IT equipments, students (dyslexic or not) have access to tape recorders, mobile phones with camera function and PCs. DIASY (a system that attempts to allow all published books to be recorded and widely available) is a useful device for reading but Japanese copyright law allow only blind people have access to talking books.

Wordprocessing

Microsoft Word and other wordprocessing software are available in Japan. There are no spellcheckers but sentences that do not make sense are sometimes underlined. There is a warning sign when you make an obvious grammatical mistake. (The Microsoft Office 2003 Editions Proofing Tools CD states it has no spellchecker, but does have grammar and style checker, an “auto correct” function and a “Translation Dictionary”.) For Kanji characters, you can select it to be supported with Kana (the Japanese syllabary).

You can select this from Kana input or “alphabetical” input from the key board. It is recommended for dyslexics and many people use “alphabetical” input as you will use only17 keys to type Japanese. You simply type a word in using the alphabet keyboard, press the enter key to change to Kanji and you will get a selection of Kanji with the same sound. If you press the enter key long enough, you get the meaning of the Kanji on the list. Of course the difficulty for dyslexics is knowing which of the Kanji to choose.

Text to speech

There are several systems available. A free 15 day trial copy of Voice of Japan is available from http://www.kanji.de/VoiceOfJapan.htm

There is also the IBM ProReader system
http://www.trl.ibm.com/projects/tts/index_e.htm

DAISY (Digital Accessible Information System) syncronizes sound, image and words. This should provide additional help to the dyslexic student. The Japanese copyright law is making it difficult for this system to work fully for dyslexics. (http://www.daisy.org/about_us/mem_detail.asp?Id=77)

Speech to text
There are two systems which work reasonably well in Japanese. These are:
Dragon Speech (ASKII) http://shop.asciisolutions.com/soft/partner.html
IBM Via Voice http://www-6.ibm.com/jp/voiceland/win.html

Other technologies
Mobile phones - In Japan almost all mobile phones are equipped with camera function and many with video devices. Many dyslexic students use this function to find out where they are by sending the image to someone who can read. Also for writing, all mobile phones have dictionary function as well. Some companies are introducing mobile phones with text-to-speech function.

Electronic dictionary - You can hand write on the pad the Kanji that you see and the dictionary shows how to read in Kana and the meaning of the word. Unfortunately this is not yet available with sound.

Barriers to dyslexics at university are: lack of understanding of their own difficulties and by others, due to the lack of awareness of dyslexia in Japan, shame, no extra time or any other facilitation for entrance exams, written exams, no arrangements for dyslexics studying…

Associations and organisations:

The Japan Dyslexia Society (NPO EDGE) was established in 2001 to provide a focus for the development of resources and training for the dyslexic individual.

EDGE, an association formed in 2001, aims to bring together professionals working with the dyslexia community, the commercial sector, government agencies, parents and carer, as well as dyslexic individuals to create an environment where the dyslexic individual may develop to their full potential. This will be facilitated through the development of awareness and understanding, as well as resources, for the support of the dyslexic individual.

The EDGE's current and future activities with respect to adults are as follows:
- Participating at the second WDP international workshop, in Cardiff.
- Making a screening tool for adult dyslexics

- Visiting UK and Sweden to explore and research on the provisions for adults

The EDGE's future plan includes:
1. Screening and assessment tool for adults
This project is designed to provide a dyslexia screening tool in Japanese.

2. Training of Job coach for dyslexics in working place
As there are no provisions regarding dyslexics at work place, we need to raise awareness of the employers and also coach dyslexic individuals to cope with situations at work places.

3. Meetings on awareness and understanding for adults and parents
The EDGE's aim is to provide brief courses (from two hours to several days) to dyslexic individuals to help them understand the issues and how they can help themselves. These may be delivered in Japanese or in English by invited guests.

4. Computer programs (text-to-speech) and use of IT and communication tools
The purpose is to develop software to help the dyslexic individuals and provide means to life easier for the individual.

5. Website for developing awareness and sharing resources.
The aim is to provide a low cost centre for information distribution and sharing.
http://www.npo-edge.jp

6. Teaching resources
It would be inappropriate to identify dyslexic students without offering some resources to help those identified. These would be based not only on those resources currently available in Japan, but would also look to other countries for ideas. EDGE is looking to develop a system of developing and distributing Romanian dyslexia resources through the web, CDs and other means.

7. Publications
The EDGE is cooperating with writers to write about the difficulties of dyslexic individuals with contact addresses and resources. (Don't call me lazy! By Yuka Shinagawa 2003).
The EDGE published a 16 pages leaflet that is presented on the website in PDF form so that it could be down loaded free of charge.

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The Netherlands

What are the barriers to learning for dyslexic adults, and how could information technology assist them?

Who has the authority to make assessment? (All ages)
Remedial educationalists, remedial teachers and psychologists. There are special institutions for assessment and treatment..

What tools are used to identify dyslexia? (Computerised and otherwise)
Depending on the age, several tests are used. The test covers the understanding of a text, counting, dictation and reading words.

What assessment is made of the difficulties, and how that is matched to needs? What software is available?
There are no computerised versions of the tests yet.

What funding is available to students? (From government, foundations, private sources, for computers, special tutors etc.)
*Primary and secondary schools now receive **direct** funding for their dyslexic students. Schools may decide how they will spend that money. Universities don't receive funding for their dyslexic students.*
In the Netherlands the Daisy (www.daisy.org) player is now paid for by the government for people (children, students and adults) with dyslexia.

What legislation (eg disability rights) support exists, including appeals procedure?
Dyslexic children were listed as handicapped students thus schools receive extra financial support for these children. The school itself can decide how to spend this money.

What support services are in place?
Primary and secondary schools receive a guide which describes how to deal with dyslexic children; what dyslexia is; what you as a teacher can do about it; and how to help the child. The guide contains many practical tips.

There are some official institutions providing support, but these are usually for seriously dyslexic children. There are private remedial services for children and adults as well.

How are support services publicized (institutionally and nationally)?
It is a basic problem that parents and teachers do not know much about support possibilities. There are more and more web pages that provide information for dyslexics and their parents and teachers.

What are the institutional policies (national and local) on technological aids?
There is no institutional policy for technological aids.

What is the variability of dyslexia support within any one institution?
The support for dyslexics in university differs per university. There are universities that hardly support students that are dyslexic, but others which help students.

What level of funding is available to students?
There is not much funding for dyslexic students. The Daisy player for spoken books is paid for.

What training is available for tutors to ensure dyslexia friendly delivery?
There is no training on teaching dyslexics for teachers in higher education.

What software is available to help the older dyslexic?
Screen readers
Speech to text
Spell checkers
Grammar checkers
Daisy player
OCR (Optical character recognition), with OCR it is possible to convert scanned documents into text.
Speech synthesizers
Mind mapping
Electronic schedulers
Memory telephones
Calculators
Dictating machines and tape recorders
Electronic dictionaries

What software is available to help the younger dyslexic?
There are several training packages, and with this software children can train their spelling, reading and writing.

Are there web sites to support them?
There is no governmental support for dyslexics through internet.
There are a lot of websites for dyslexic, these websites are set up and hosted by universities doing research on this topic. Most websites are set up and hosted by dyslexic and parents of dyslexic.

What percentage of dyslexics are at university?
No data available.

What are the barriers to dyslexics being at university (eg the need to pass exams in a first or second language, or general lack of support from early on)?

One of the main barriers is that the students need to read a large amount of text at university. In addition, the books are difficult for two reasons. The first one is that the book is not always in the mother language, the second reason is that the words in the books are very complex.

Another barrier is that students have to work in groups and that the mark counts for the whole group. A dyslexic student who is not good at spelling can influence the result of the assignment for the whole group.

What are the problems in the language that technology could address?
A computer with spelling- and grammar check helps. If a students gets the notes before class would help as well. There is a lot of other software that helps such as speech to text and screen readers.

What is the relative cost of

Computers	*1000-2000 euro*
Tape recorders	*100 euro*

Do lecturers allow tape recorders to be used in lectures?
Yes.

Are handouts generally provided?
Occasionally.

Which institutions/suppliers have been contacted to verify the above?
A literature review has been conducted. In addition, there have been five interviews with user experts and seven interviews with dyslexic people.

Author: David Crombie

Dyslexia in Poland

Marta Bogdanowicz and Alicja Kasica

Country: Poland
Year of entry to EU: 2004
Political system: Republic
Capital city: Warsaw
Total area: 312 685 km2
Population: 38 175 000
Currency: Polish zloty (PLN); 4 PLN ≈ 1€
National language: Polish
Number of students entering the first grade of HE institutions in 2004: 507,049
(no data available on the total number of students in all grades)

Generally speaking the problem of dyslexia in Poland is very well recognised because the first publications on specific difficulties in reading and writing appeared in Poland before the Second World War and that Polish Dyslexia Association is raising awareness in this problem for 15 years (it was established in 1990). There is growing social awareness of these matters, more and more support, also from official authorities, but it does not go beyond the final exam in high school, which is the last moment, when a dyslexic has some special arrangements available. Developmental dyslexia is well recognised on all the educational levels, but not at the university level.

Definition of dyslexia:
Our concept of specific difficulties in reading and writing (developmental dyslexia) is based upon several general theories. These include Luria's theory of the functional organisation of higher mental functions (1976), Konorski's theory of integrative activity of brain (1969), Spionek's theory of psychomotor developmental deficits (1965) and theory of perceptive-motor integration of Bogdanowicz (1987). In accordance with these ideas, it has been accepted that reading and writing are highly structured psychological functions. They have a systemic structure and dynamic character (changeable in process of learning). These complex functions are realised by the integrated activities of several parts of central nervous system. Their disturbances are usually defined as a syndrome called 'developmental dyslexia'. In international classifications of diseases ICD-10 and DSM-IV they are referred to as 'reading disturbances' and 'specific reading disturbances'. They are accompanied by the difficulties in learning how to write: the spelling mistakes and/ or poor handwriting, in spite of normal intelligence, lack of sensual disturbances and normal environmental conditions - proper care of family and school.

Developmental dyslexia is treated in Poland as a syndrome consisting of three kinds of disturbances: specific reading difficulties (dyslexia - 'dysleksja'

in the terminology using in Poland), difficulties in spelling (dysorthography - ‘dysortografia’) and handwriting (dysgraphy - ‘dysgrafia’). These are the result of disturbances in phonological and visual processing in time and space, which is observed as a narrow range of disturbances of psychomotor development of some cognitive functions (i.e. visual, auditory attention, perception and memory, phonological skills and awareness), motor functions and their integration (perceptive-motor integration) (Bogdanowicz 1987, 1997; Krasowicz-Kupis 1998,1999).These terms were based on the definitions accepted by the World Neurologists Conference in Boston in 1968 and International Dyslexia Association in 1994.

Polish educational system

Educational system in Poland has been reformed very recently and the changes are still being introduced at the moment.

Kindergarten is not obligatory in Poland and starts at the age of 3. A child can attend it for 3 years. At the age of 6 all children attend obligatory “0” grade, which can be placed either in kindergarten or school. In this class children start learning to read (some children who are interested in writing start learning to write, with block letters only). Children in kindergarten age have different activities preparing to further learning, but do not have regular classes and mostly spend time playing. Primary school starts at the age of 7 and lasts for 6 years. At the end of this level of education children take so-called “Competence Test”, which is an external assessment of their basic educational skills and general knowledge. It is divided into humanistic and science part. Results of this test are the basis for applying to the next level of education – gymnasium (junior secondary school), which lasts for next 3 years. Some better gymnasiums accept only candidates with high achievements in the test. The same situation takes place before entering the next educational level – lyceum (senior secondary school – high school) which starts at the age of 16 and take another 3 years. Students are applying to the chosen lyceum on the basis of their results from the “Gymnasium Exam” – final external test in junior secondary school.

While primary school and gymnasium offer general education, on the level of high school pupils start to specialise. Most of them choose to continue general, “academic” education in lyceum, but it is also possible to continue education in technical school or vocational school. High school ends with external final exam (matriculation), which is since 2005 the basis for entering the university or other higher education institutions. Matriculation consists of oral an written examinations on Polish language, foreign language, mathematics and at least one other chosen subjects.

Some universities might organize additional forms of examining the candidates: interviews or specific tests to recognize skills in certain area of

interest or reading skills of scientific texts. Most of the universities offer education on 2 undergraduate levels (bachelor degree and master degree).

Authority to make assessment
Assessments of dyslexics are performed by the interdisciplinary teams of specialists including clinical psychologist, educators, sometimes (where necessary) speech therapists, physicians working in a public or chosen non-public psychological-educational clinics. Such clinics are available in all larger towns all over Poland (each school is under care of one certain clinic).

Children are assessed on request of parents/teachers and should have a referral form from school psychologist. In most cases they are diagnosed before final examinations on each educational level, as recent legislation offers some privileges for dyslexics during these exams.

However, assessment in adults is very rarely done in case of adults, so HE dyslexic students have a small chance to get diagnosed if it did not take place before entering the university.

Tools to identify
The theoretic assumptions determine the diagnostic procedure used to identify difficulties in reading and writing. Hence, the diagnostic examination includes the evaluation on the level of the development of visual and auditory perception and memory, language functions, motor skills, sensorimotor integration, laterality as well as orientation in body and space schema.

The starting point for the diagnosis of potentially dyslexic child is the evaluation of intellectual efficiency with use of Wechsler Intelligence Scale for Children (WISC-R). Quantity data as well as profile of results are analysed in order to find the pattern specific for dyslexic children.

The next stage of formal assessment is diagnosing certain functions with use of a set of tests and trials, interview, observation and analysis of documents. In order to do this a number of different trials and tests are performed to assess:

- Reading and writing tests
- Visual function (e.g. Rey-Osterrieth, Bender-Santucci, Benton)
- Auditory and language functions (e.g. Stambak, Bogdanowicz, Krasowicz-Kupis, Zakrzewska)
- Motor function (Zazzo, Stambak)
- Space orientation (Piaget)
- Laterality (Zazzo)

In order to assess the degree of developmental delay of diagnosed function the Indicator of Partial Developmental Deficit (PDD) applied by Spionek is

used. The range of disturbances is estimated by the number of incorrectly developed functions which influence reading and writing as well as a degree of disturbances (indicator of PDD).

Children should be fully diagnosed by an interdisciplinary team: psychologist, educator, speech therapist and sometimes physician (e.g. neurologist, psychiatrist, and optician) in order to receive remedial help best fitted to age, depth and range of disturbances.

Software available
There is no software available specifically for dyslexic HE students. All they can use is a spellchecker in MS Word and other similar programs.

Software available for younger children
There are a number of educational games available that are designed especially for dyslexic children. Some of them can be accessed also via internet (e.g. www.ortofrajda.pl). They are mostly concentrated on teaching correct spelling, as this is one of major problems of Polish dyslexics.

Funding available to students
There is no special funding available for dyslexic students in Poland.

Legislation
There is no legislation concerning dyslexia at university level. Recently introduced legislation (legal acts on internal and external assessment in primary and secondary education - 2001) guarantees some special arrangements for dyslexics in primary and high school. Most important of them concern final examination in high school (matriculation), which is the basis to enter university at the moment (since 2005). Legislation regulates the way of assessing the written work of dyslexics – not considering the spelling mistakes and poor handwriting. It gives them also the right to type their answers using computers, if their handwriting is very poor.

Support services
There are no possibilities of support services available for students at the university level.

An official system of remedial teaching is designed only for the school children. In Poland the term ‘educational therapy’ (terapia pedagogiczna) is used to describe the treatment through educational activities, the aim of which is to remove or diminish the developmental disturbances. This involves increasing the efficiency of disturbed functions (correction) and stimulation of undisturbed functions (compensation).

There are six levels of remedial help available for children with reading and writing difficulties.

- help of parents under teacher's guidance
- remedial teaching in small so called corrective-compensative groups at schools
- individual therapy in psychological-educational clinics (state or private)
- therapeutic classes (in primary schools and gymnasium only)
- day-care centres and wards providing intensive remedial teaching as well as medical therapy (few months stay)
- integration classes and schools, therapeutic summer camps organized by the Polish Dyslexia Association (PDA).

Special educational services for children with dyslexia have been improving gradually over the past 10 years, mainly thanks to establishing private therapeutic centres and to activities of the PDA. Now our main goal is developing the system of prevention of specific learning difficulties in reading and writing of children in risk of dyslexia.

How are support services publicised?
It is done mainly by activities of Polish Dyslexia Association, which makes nation-wide awareness actions including distribution of leaflets, posters, organisation of courses, conferences, presence in media etc. However, none of these actions apply to dyslexic HE students.

Institutional policies
There is no institutional policy created for dyslexic students at the university level. The problem of dyslexia in HE is not being recognised in Poland yet. Universities are not even aware of the number of dyslexics studying in their institutions.

Each university is obliged to employ a spokesman of disabled students. Their activities are concentrated on supporting deaf and blind students as well as the ones with motor handicaps. They do nothing that could concern dyslexics. In some cases (though unique) dyslexic students who address them may receive some help in mediation between the student and lecturer (e.g. in order to be allowed to take an exam in oral form instead of written form).

Technological aids
As the problem of dyslexia in HE is not recognised there is no support developed specifically for dyslexic students. There are tools being designed for students with different disabilities (e.g. blind or deaf), but none for dyslexics.

Training available to tutors
There is no training on dyslexia provided for academic teachers. Most of them are not aware of the problem at all. Some information is included in school

teachers' training program, and there are postgraduate courses and studies on dyslexia available, but these are not addressed to university teachers.

Web sites to support

The most useful website is www.dysleksja.univ.gda.pl – it is website of Polish Dyslexia Association including all the most recent information concerning the problem of dyslexia in Poland. There is also a number of websites with training programs or useful information for dyslexic children, their teachers and parents, such as:

www.reedukacja.pl
www.republika.pl/terapiapedagogiczna
www.ortofrajda.pl

There are no websites available that support specifically HE students.

Percentage of dyslexics at university

There is no data available concerning the number of dyslexic students in HE. No research has been conducted yet and universities do not collect such data.

Barriers to dyslexics at university

There are no formal arrangements or official policy for dyslexic students at the university level.

Some universities (though much less than till 2004, before introduction of the new final exam after high school) organise additional entrance exams checking individual skills in certain areas (e.g. reading comprehension). They are very unlikely to consider student's dyslexia during these examinations, and for this reason these students fail to enter to university, even though they might achieve good results in final high school exam (where their dyslexia is taken into consideration).

While studying, dyslexics have to take a number of written exams and tests and it depends only on good will of an examiner, whether it is possible to take them in oral form. There is no official policy in this matter.

Another problem is access to computers and ICT tools. There are very few computers available on most universities for students. Due to decreasing prices more and more students have their own computers at home, but there is no funding available for those of them, who cannot afford it.

Tape recorders/handouts in lectures

Tape recorders are generally allowed in lectures, but there are no official procedures concerning it. It depends on the good will of a given lecturer whether he/she allows recording. It also depends on teachers whether handouts are provided, however more and more lecturers do it nowadays. It is

also very popular in our country that students photocopy each other's notes from lectures.

Effect of entry to EU

There is no change of official policy considering dyslexic students at universities. The only difference is more availability to different forms of EU funding for students, however, there is no funding designed especially for dyslexic students. There is not enough awareness of possibilities to access these funds in our society.

Relative cost of:

The average price of

Computer – 500-1000 €

Tape recorder – 125-250 €

When compared to average income (ca. 400 €/month) it is still very expensive.

Problems with Polish language

1. Polish script

In Polish language an alphabetical script is used. This kind of script, in which letter signs correspond to phonemes was first created around 8th century BC and was brought to Poland together with Christianity (Latin rite) in 10th century CE. It took few centuries to adapt Latin script to over two times larger range of Polish phonemes. That is why the first full text written in Polish language dates form as late as 14th century CE. Spreading of use of print in 16th century caused attempts of standardizing Polish script.

There are numerous discrepancies among descriptions of modern phonological system of Polish language. They concern e.g. the number of phonemes (one of proposals: 37; Wróbel, 2001) or number of distinctive features that are the basis for differentiating the phonemes (e.g. 11 or 12; Wróbel, 2001; Laskowski, 1994). As there are more phonemes in Polish than letters in Latin language, specifically Polish letters with diacritical marks (e.g. 'ę' for nasal 'e') as well as letter dyads (e.g. 'sz' for the sound [ʃ]) appeared in our alphabet during the process of script creation. Modern Polish alphabet consists of 39 letter signs:

- 32 single letters:
  24 basic letters: a, b, c, d, e, f, g, h, i, j, k, l, ł, m, n, o, p, r, s, t, u, w, y, z
  8 letters with diacritical marks: ą, ć, ę, ń, ó, ś, ż, ź
- 7 letter dyads: ch, cz, dz, dż, dź, rz, sz.

Among them there are 9 vowels: a, ą, e, ę, i, o, ó, u, y and 30 consonants: b, c, ć ch, cz, d, dz, dż, dź, f, g, h, j, k, l, ł, m, n, ń, p, r, rz, s, ś, sz, t, w, z, ż, ź. (Gałkowski, Jastrzębowska 1999).

2. Grapheme-phoneme correspondence

Unlike English, Polish script it is basically phonetic, because of that reading is quite easy; however spelling is difficult because there is a number of differences between speech and script:

1/ given letter may correspond to more than one phoneme;

2/ given phoneme may be coded with different letters;

3/ given phoneme may be coded with one or two letters;

4/ set of two following phonemes may be coded with one or two letters.

The above summary does not list all the reasons of discrepancies between speech and script.

More than half of the letters are multifunctional: they function as separate phonemes, as parts of phonemic dyads or can also be pronounced as its voiced/unvoiced equivalent depending on its position in the word. For example letter ‘d’ can function in 8 different phonemes: voiced [d], unvoiced [t] and phonemic dyads :[dz], [dż] and [dź] and their unvoiced equivalents: [c], [cz] and [ć]. Due to this fact notation of many words is different from the phonetic one. Such discrepancies appear in other languages with different intensity (Jassem,1973). The weakest grapheme-phoneme correspondence is observed in English and French. In Polish language a considerable consistency in this correspondence is observed, however, not as strong as in Slovak or Czech and, above all, Finnish and Hungarian (Jassem 1973).

The conservatism of the historically established graphic forms of words causes the slow transformation of the Polish writing language into ideographic one. This produces some set of words causing spelling problems. Some of them can be explained by certain orthographic rules. There are however also words, spelling of which has to be learned by heart.

Generally Polish orthography is based on 4 rules:

1. **phonetic rule** (write as you speak and hear): this rule is used in the widest range;
2. **morphological rule** (belonging to a certain category of words decides on the spelling): in each category the same morphemes are used, although appearing in different variations. This gives the clue which version of homophonic spelling should be used in case of letters that are read in exactly the same way (e.g. ‘u’ and ‘ó’);

3. **historical rule** (write as it has been written by now): this rule concerns mostly words that have to be learned by heart, as no orthographic rule can explain their spelling;
4. **conventional rule** (write as it is agreed): from time to time Polish linguists decide on some spelling rules (e.g. which words should be written separately from pronouns or particles, or how to use capital letters). (Gałkowski, Jastrzębowska 1999).

All the above cause much **more problems in writing than in reading.**

Summary

As it can be seen from the above text, there is practically **no support for dyslexic students in Higher Education in Poland**. No legislation is available, therefore universities have no official policy to deal with the problem, and the academic teachers are both not aware of it and not willing to support dyslexics. This is why dyslexia is very likely to block ones further education and professional career in Poland.

Romanian Perspective
Georgiana Ghitulete

Introduction
This chapter reflects the situation with respect to the adult dyslexic individual in Romania. This subject is not widely discussed in Romania, and as a consequence, with respect to the specific areas addressed in this trans-European project, currently there is not a lot to report. However, the recent formation of the Romanian Dyslexia Organisation has provided a focus to the development of collaborative projects, and a start to the development of resources for the dyslexic adult. Where appropriate, mention of the resources (or lack of resources) for children is also included.

Country
Romania is a candidate for membership to the EU for the 2007. It is a Parliamentary Republic, with the capital being Bucharest. In the past it has been referred to as "The Little Paris". There are 21,680,970 people living in a total area of 238,391 sq km (about 91 per square kilometre). The currency is leu and minimum salary per month of 63 euros. Romanian is the National Language, but others are used as well, including Hungarian (6.7%) and Rromany (1%). It has been estimated that there are 1.5 million graduate students and 500,000 illiterates' adults.

According to national statistics (2002) the school population is around 3.9 million, or about 18% of the population. Of this, 1 million are at primary school (7-11 years old), 2.3 million at secondary and high school (11-15 years old), and a further 564,000 at university.

There are two kinds of university: state run universities and private universities. In the state sector, there are 56 universities and 70 colleges in Romania. There are 68 private universities. The main centres are Bucharest (130,969 university students), Cluj, Iasi and Timisoara. There are two types of first degree: short term university course are for 3 years and long term degrees take 4-6 years. A Masters takes another 1 ½ years. As a general principle, the state universities have higher entry qualifications.

Legislation
Despite considerable education reform over the past 15 years, specific learning difficulties have not been addressed. This is despite Romania signing the Salamanca Declaration, which should have paved the way to policy development and implementation in the area of special educational needs. The Declaration highlighted that every individual "has unique characteristics, interests, abilities and learning needs" (Salamanca, 1994). However, Romania Disability Discrimination laws only deal with the more "traditional" disabilities of physical disabilities, the deaf and the blind, without looking into the "invisible" disabilities, such as dyslexia.

Definition of dyslexia:
With more than 50 years in communism and depending politically of the Russian power, it is not surprising that in education Romania has adopted many of the Russian perspectives. Consequently, for many individuals, the term dyslexia is used strictly for reading difficulties, whilst the term dysgraphia is used for writing difficulties.

Even when accepting the existence of a difficulty of reading caused by deficiencies of auditory, visual or kinesthetic perception, specialists use the "dyslexo-dysgraphia" term instead of "dyslexia". However, most people do not know what either of them means. Paunescu (1984) defined dyslexo-dysgraphia as a difficulty in phonetic integration, meaning insufficient auditory/visual discrimination of sounds in heard word and letters in read words, causing misspelling.

More recently, with Romania seeking entry into the European Union, the definition of handicap is being guided by EU politics. The Law 53/1992 regarding The Special Protection of Handicapped People states that a handicapped individual is defined as somebody who cannot fully integrate, either temporarily or permanently, into social and professional life due to sensorial, physical or mental deficiencies, and needs special support.

The recently formed Romanian Dyslexia Organisation (ODR) has adopted a definition (see later in this chapter) which conforms to the currently widely adopted approach of using fluency and accuracy as the basis of a definition (Health Council of the Netherlands, 1997; British Psychological Society, 1999: NIH, 2002).

Assessment
At present, there is no specific test or battery of tests for identifying dyslexia in Romania for children or for adults. The tools used to identify those with dyslexia are adaptations of international tests, like the Borel-Maisonny Test (alphabet naming, consonant discrimination) and Romanian tests for oral language assessment. These include tests of comprehension and association of words within stories (Schiopu and Garboveanu) and for lexical and graphic assessment of phoneme/grapheme, picture/word, written/auditory correspondence (Natalia Gheorghita et al).

There are no Romanian standardised reading tests. Although the tests undertaken show poor reading age against the norm within the school population, these tests are only based on specialists' local knowledge. There is a lack of awareness of dyslexia in Romania (no computerised testing, no statistical studies – prevalence of dyslexia not known, lack of professionals).

It is generally acknowledged that those who have taken a psychology degree and then taken further special needs educational courses are entitled to assess individuals. This includes psychologists, speech therapists, counsellors and special needs teachers. However, none of them are specialised in dyslexia and there is no training available for tutors to ensure dyslexia friendly delivery of services.

Very few professionals remain in the field of dyslexia, as it is not well paid, so there is very little research.

Dyslexia Organisation of Romania (ODR) has developed a series of tests which help identify the difficulties of the dyslexic individual. These test are not normed, but have been developed for research involving 100 children. These tests may be used for clinical diagnosis (not normed referenced). They may also be used for assisting in the identification of the difficulties of the dyslexic adult.

A screening test for the dyslexic Romanian adult has also been developed (Ghitulete, in preparation), based on the work of Smythe and Everatt (2001).

Support
There are no specialist institutions or schools for individuals with dyslexia. However, there are institutions for all special needs and assessment for dyslexia is conducted at these places. Those diagnosed as dyslexic are sent to a special school for all disabilities where they are grouped by disability, or stay in mainstream schools. Adults attend a hospital with a specialist centre for assessment – very few of these are available. There is no support at university.

Funding
There is no specific funding (and therefore no support) for dyslexia under the Minister of Education. Specialist teachers and speech and language therapists work with all special needs children including those with dyslexia in public schools (computer technology is in a few classes) or in special schools (funding is available only for children who get the status of disabled, but only administrators have computers) and only specialist teaching. No assistive technology support is available in vocational schools (15-18yrs).
Adults attend speech therapy clinics in hospitals paid for by the Ministry of Health. There is no research investigating how adults and university students cope. The technology is home based and no financial support is available.

Technology and support
Thanks to Minerva Project**,** there are now two pieces of software available in Romanian for uses by the dyslexic student. These are a concept mapping tool (MindFull) and a beta version of text to speech software (SpeakOUT). However, assistive technology remains home based because schools cannot

afford the technology. To make you an idea, at a minimum salary per month of €63, the Romanian needs to pay around €50 for a tape recorder and €700-800 for a computer. In universities tape recorders are allowed and handouts are available from teacher or colleagues, but usually there are fees for acquiring them. The effectiveness of these tools as supports for dyslexic individuals is being evaluated as part of a wider project on the use of controls within existing technology such as Microsoft Word (e.g. using the spellchecker, grammar check, auto correct and sensory preferences).

Barriers to dyslexics at university are: lack of understanding of their own difficulties and by others, due to the lack of awareness of dyslexia in Romania, shame, no extra time or any other facilitation for entrance exams, written exams, no arrangements for dyslexics studying at university.

Associations and organisations:
Romanian Speech and Language Assoc.
The "Dyslexia Organisation" from Romania (O.D.R.)

The Dyslexia Organisation of Romania (O.D.R.) was established in 2003 to provide a focus for the development of resources and training for the dyslexic individual.

The definition of dyslexia adopted by the ODR is that proposed in the course of the Welsh Dyslexia Project Minerva project:

> *Dyslexia is a difficulty in the acquisition of literacy skills that is neurological in origin. It is evident when accurate and fluent word reading, spelling and writing develops very incompletely or with great difficulty. It may be caused by a combination of phonological, auditory, visual and working memory processing deficits. Word retrieval, speed, morphological and syntactic processing difficulties may also be present. This does not negate the existence of comorbid difficulties, including receptive and expressive oral language deficits, developmental coordination difficulties and dyscalculia. The manifestation of dyslexia in any individual will depend upon not only individual cognitive differences, but also the language used.*
>
> *Smythe, 2004*

The reason of employing this kind of causal definition is that it is most helpful for the creation of assessment tools and resources of intervention in Romanian language according.

ODR, an association formed in 2003, aims to bring together professionals working with the dyslexia community, the commercial sector, government agencies, parents and carer, as well as dyslexic individuals to create an environment where the dyslexic individual may develop to their full potential.

This will be facilitated through the development of awareness and understanding, as well as resources, for the support of the dyslexic individual.

The ODR current and future activities with respect to adults are as follows:

- June 2003 – Participation in the International workshop in Edinburgh by the Welsh Dyslexia Project (WDP), and presentation of the first paper on *Dyslexia in Romania* outside of Romania.
- Sept 2003 - Pilot study of Romanian cognitive profiling test to identify the dyslexic individual
- Nov 2003 - *"Identification of the dyslexic Romanian university student – a provisional analysis""* – paper presented at the second WDP international workshop, in Cardiff.
- Nov 2003, attendance and sign up to the WDP project on ICT based teacher and parent training.
- Nov 2003 – Launch of beta version of MindFull, the Romanian mind mapping program.

Future plan of ODR include:
1. Screening and assessment tool for adults
This project is designed to provide a dyslexia screening tool in Romanian. Some initial data collection has taken place.

2. Conference for professionals (speech and language therapists, teachers etc)
Conferences and courses will be presented as part of a continuing professional development programme to ensure professionals know how to work with dyslexic individuals. These may be delivered in Romanian (preferred) and in English by invited guests.

3. Meetings on awareness and understanding for adults and parents
The aim of ODR is to provide brief courses (from two hours to several days) to dyslexic individuals to help them understand the issues and how they can help themselves. These may be delivered primarily in Romanian or in English by invited guests.

4. Computer programs (text-to-speech and mind mapping tools)
The purpose is to develop software to help the dyslexic individuals.

5. Website for developing awareness and sharing resources.
The aim is to provide a low cost centre for information distribution and sharing. The WDNF has offered to host the site for now, to minimise costs for the organisation. They have also offered to assist in the development of some pages, all of which will be in Romanian.

6. Teaching resources

It would be inappropriate to identify dyslexic students without offering some resources to help those identified. These would be based not only on those resources currently available in Romania, but would also look to other countries for ideas. ODR is looking to develop a system of developing and distributing Romanian dyslexia resources through the web, CDs and other means.

7. Publications
The aim of ODR is to provide information on dyslexia to parents of dyslexic children, to professionals and for dyslexic students. This includes information and study skills.

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Dyslexia in Spain

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1. Introduction.

Reading and writing are two basic resources necessary for the compulsory education, and to cope with daily activities in current society. Most students acquire easily the reading and writing skills. Nevertheless, some students are unable to learn at the same rate of their schoolmates. In some cases, their slower development could be overcome by providing a firmer the basis for reading and writing. Still, a small group manifest a more specific disability, characterized by alterations in the order of letters, misspellings, and change of phonemes, confusion between words, and other difficulties for the processing of written information. These difficulties constitute the core symptoms of dyslexia[1] (Cuetos, 1990; Peña, 1998) and remain unless the child is provided with special training. If no remediation is provided, the students may be slow readers, show difficulties in reading comprehension, note taking, and have a low performance in written tasks (Reid and Kirk, 2001). It is important to note that dyslexia affects directly, or secondary, to a wide range of personal aspects (Bruck, 1998; Loughlin, Leather & Stringer, 2002). Dyslexia does not limit its impact to reading and writing abilities. As most of the academic work depends on the comprehension or production of written material, the dyslexia affects to the general student's performance. Furthermore, dyslexic people also manifest some other cognitive difficulties such as focusing their attention, organising their work and working memory, which could be interpreted as a problem of information processing. As a consequence, it is not infrequent that dyslexics experience repeated academic failures, which could undermine their self-esteem and the confidence in their abilities. In fact, many dyslexics develop compensating strategies to avoid those situations where their problem could be revealed (McLoughlin et al., 2002).

At present, there is a general agreement as to the importance of the early detection of the students with reading and writing disabilities. It emphasised the importance of establishing an early and accurate diagnosis in order to assist these students'. This is essentially responsibility of governments: to provide the professional and technological means to support the process of adaptation to the demands of an alphabetised society. In this chapter we will review the actions that have been implemented with the aim of preventing, detecting, and providing support for the reading and writing difficulties. Nevertheless, it should be noted that the variability amongst dyslexics calls for a wide approach to the problem (Valle, 1996; Cuetos, 1999; MCloughlin et al., 2002).

[1] As the Spanish legislation does not include the dyslexia as a separate category, henceforth the expressions reading/writing difficulties and dyslexia are going to be used along the text.

2. Definition of Dyslexia

In Spain, the diagnosis of dyslexia is established by the range levels of standardized tests according to the criteria, and DSM IV.

315.00 READING DISORDER

- As measured by a standardized test that is given individually, the patient's ability to read (accuracy or comprehension) is substantially less than you would expect considering age, intelligence and education.
- This deficiency materially impedes academic achievement or daily living.
- If there is also a sensory defect, the reading deficiency is worse than expected.

315.2 DISORDER OF WRITTEN EXPRESSION

- As measured by functional assessment or by a standardized test that is given individually, the patient's writing ability is substantially less than you would expect considering age, intelligence and education.
- The difficulty with writing grammatically correct sentences and organized paragraphs materially impedes academic achievement or daily living.
- If there is also a sensory defect, the writing deficiency is worse than expected.

According the Spanish legislation any disability could be evaluated as a difficulty in succeeding to follow schooling or to carrying out a job. In this sense, children with dyslexia could be included in special educative programs. However, the current regulations on special educative needs do not consider dyslexia as a specific disorder. It is rather included into the more general category of Learning Difficulties.

Nevertheless, although there is not any official definition that settles the criteria to be used by the School Orientation and Evaluation Teams, very recently the guidelines for intervention with children diagnosed of dyslexia have been appearing in some informal documents that regulate internal function of the Orientation and Evaluation Teams in some Autonomic Communities. For example, in the Community of Madrid there is an internal, non-official, document that specifies the criteria to include children with dyslexia in the groups of special educative needs. Also, in the Andalusian Community, the school counsellors, the agents who decide whether students with dyslexia should receive special support, count with a document that establishes the general guidelines for evaluation.

A consequence of this lack of specificity is that little support is offered to dyslexics in Public Centres, and most of them are obliged to look for external private help in order to follow compulsory education.

3. Legislative framework

The Equality in Rights for all Spanish people was enacted by the Spanish Constitution in 1978. Its application to the Education System is specified in the article 27 that recognizes the Right of Education for all Spanish people, and in the article 49 that *commits Public Authorities to carry out a policy of prevention, treatment, rehabilitation and integration for the physical, sensorial and psychic disabled, and to provide specialized attention and protection to ensure their benefit of the Rights conferred by the Constitution to all citizens*.

Later laws regulate the students' rights to receive compensatory support for their deficiencies (Organic Law 8/1985, july 3rd, *Reguladora del Derecho a la Educación*). There have also planned actions in the field of education to establish means of compensation (Organic Law 1/1990, October, 3rd, *Ordenación General del Sistema Educativo*).

However, the term dyslexia is not specifically included in the Spanish legislation. The Laws enacted by the State as well as the Autonomic Communities use the general expression *students with special educative needs*. The Organic Law 9/1995, November 20th, on the *Participation, Evaluation and Schools Government*, defines students with educative special needs as those who "*require specific assistance due to physical, psychological or sensory disabilities, because they manifest behavioural disorders, or they belong to cultural or social disadvantaged populations"*. This definition is ratified by the most recent Organic Law 10/2002, December 23rd on the *Quality of Education*. By this Law the Autonomic Communities are obliged to accept these precepts, and to enact specific laws in order to provide support to students with special needs "*in order to enable them to able to get the educative objectives*".

For further information about legal provisions there are two very informative web pages. The official page of the Ministry of Education: http://www.mec.es, and other page specialized in Education Laws and dispositions: http://www.orientared.com.

3.1. An example: The Solidarity Law.

The goal of the Solidarity Law (*Ley de Solidaridad en Educación*) 9/1999, November18th enacted by Andalusian Autonomic Government is to protect the equality in rights and to provide the means that guarantee education for students with special educative needs due to physical, psychological, cognitive or sensorial impairments. The Solidarity Law establishes the following goals and duties:

a) The screening and diagnosis of students with special education needs.

b) The establishment of strategies for prevention and compensatory education.
c) Regular assessments and follow up of students with special educative needs.
d) Promotion of research
e) Continuous teacher training
f) Development of teaching material

3.2. The problems with the law application.

There is not doubt that the continuous reforms of the Education Laws have been addressed to a better and wider integration of people with different special needs (sensorial, cognitive, physical or cultural). However, the actual legislation shows important deficiencies to be implemented that limit the effectiveness of the measures intended to compensate inequality of conditions. In the following paragraphs we are going to examine some of these limitations.

a) Vagueness. The Law offers imprecise and general definition of the deficiencies considered the cause of special attention. The agents of evaluation are in charge of the decision about the students to be included in special programs. More concretely, in relation with dyslexia, and other learning difficulties, due to the lack of specific norms, they have to take the decision as a function the students' responses to tests and their school performance, and most of the time following the advise of the class teacher.

b) Lack of personal and technical means. The activation of legal provisions requires economical, personal and material means which are not always provided to the Educative Centres. Nevertheless, different questions affect to Primary, and Secondary and High School. Many Primary Schools share a Speech Therapist with other Centres of the area, who attends the students one or twice per week. This professional is in charge of the dyslexic students' intervention. However, the Speech Therapist's work is frequently focussed in the impairments specifically defined by the law (Mental Retardation, autism, …).

On the contrary, there is not Speech therapist in Secondary or High Schools. In fact, the evaluation and remedial functions are in charge of the educational counsellor. This professional has the responsibility of screening, orientation, and program adaptation of a wide number of students. The number of duties and students exceed the capacity of the counsellor. It would be advisable to provide assistants, by collaboration grants or students taking part in their Practicum course.

c) Plans for training and selection of professionals. Other limitation comes from the limited specialization of the professionals who are in direct contact with the students. Teachers are very often overburdened with their teaching

duties. The number of students is very high to pay attention to those with special needs. In the case of reading/writing difficulties, most of the teachers lack of training to detect the origin of the student's difficulties. In addition, most of them have not received any training to accommodate their programs to help the students with learning difficulties. The training of teachers should be designed to make them aware of the students' difficulties, and to provide them with techniques for curriculum adaptation to the special needs of their students. In the case of Primary Education, the Orientation Teams may be designed to develop and provide a program of curriculum adaptation to facilitate the teacher's work in the classroom.

In Secondary and High Education, the Orientation Teams work with fewer resources, and they lack of speech therapists. Programming activities of remedial education is the responsibility of the school counsellor.

Counsellors frequently request refresher courses to receive information about theoretical and technical innovations, and specialised training, at least, in relation to the most common problems within the school environment.

4. Who does the assessment?

The law of Education establishes the creation of a Department of Orientation in Primary and Secondary and High schools. However there are several differences in the scope and aims of the counselling depending on the academic level. Most frequently, teachers request the counsellor assessment of the child. On other occasions, it is the general practitioner who recommends the child's assessment. Adults decide individually, unless they are sent by the neurologist or the general practitioner. The assessment takes place in the institution or office where the professional works: school, private centre, etc.

In Primary Schools the Orientation Team is composed of Education Psychologists, specialists in education, and Speech Therapists. The advantage is that any problem could be approached by different perspectives, although in practice they have more limited possibilities. This multiprofessional team accomplishes the functions established by the Law:

- Screening and diagnosis of children with learning difficulties, psychological or cognitive deficits.
- Evaluation of those students who have been identified as manifesting lower levels than the classmates.
- Adaptation of school programs for those students with special needs.
- Very frequently, counsellors are requested to conduct with the students training.
- It is also the responsibility of the counsellor to give teachers' and parents' guidance on the student.

In Secondary and High Schools, although there is a counsellor (usually an Education Psychologist), his/her main duties are associated to vocational orientation rather than to assessment or any kind of treatment. It is not

uncommon that the counsellor's function is limited to evaluation or general orientation with the course tutor.

If the dyslexic is an adult, a possibility is to ask for evaluation at the official Centres for evaluation, where the accreditation of disability is expended. There is always a referral when there is a literacy loss as a result of an injury (acquired dyslexia). The patient would only receive financial support if he/she is unable to work.

5. Who funds assessment?

Institutional

The assessment, with the limitations explained above, is funded by the Government when the students attend a Primary or Secondary and High School. In some schools, the Parents' Association hires the services of a Psychologist who provides services of screening and remedial training for those students who manifest learning difficulties.

However, there is no assistance provided by Universities to students with either learning, reading or writing difficulties or more specifically, a diagnosis of dyslexia. Although, it is common to find a psychological service, only courses of Study Skills or to reduce the stress to exams are offered to students who show difficulties in studying, taking notes, or filling up exams.

Private

Frequently, children diagnosed as dyslexic, with a low school performance must go to private centres where they receive specific and systematic attendance. To get satisfactory results, the treatment has to be specific, to follow a program of intervention to provide the child with the strategies that compensate the deficit. In addition, the treatment should to be long enough to consolidate learning and to result in an automatic use of the strategies. Of course, in this case the length of the treatment depends on the economic situation of the family.

In order to get financial support it is necessary to hase a certificate from the Orientation Teams of the existence of a diagnosis and to authorise the provision of financial support for private assistance. There are also some associations that give advice and support to parents and children, and sometimes offer treatment with lower costs. Still, the expenses could be too high for some families, especially when the treatment is long lasting.

Private medical companies do not finance the treatment for reading or writing disorders. Funding is only provided to disorders such as aphasia, deafness or dysphonic.

5. ASSESSMENT TOOLS

The purpose of the assessment is to identify those who do not achieve average performance and to determinate the nature of their difficulties in order to structure a plan for intervention or training in compensation strategies.

Assessing reading and writing difficulties in young people implies the evaluation of different abilities from intelligence and cognitive abilities to spatial orientation and work organization, apart from those directly related to literacy or language use. As was noted earlier in this chapter, given that cognitive and linguistic abilities progress in parallel, developmental dyslexics ordinarily show a wide range of difficulties. Some of them are secondary deficits, however many others form a group of symptoms that constitute the core of the dyslexic's disability. The tests selection tests can be used to detect the nature and magnitude of the problem, and to reject alternative explanations such as low intelligence, perceptual of psychological disturbances, etc. In the following section, the most frequently used tests are described, giving special attention to those specifically designed assessments of reading and writing disabilities.

5.1. Intelligence Scales:

In Spain, the evaluation of intelligence is still required to get a diagnosis of learning difficulties. Intelligence scales allow assessing patient's performance in non linguistic areas which is necessary to reject mental retardation as the origin of the student's difficulties. As these scales are well known, we are going to give a short description.

Weschler Scales:

These scales provide a measure of the global intellectual capacity, as well as allowing discrimination between verbal and manipulative abilities. This provides important information to diagnose dyslexics and people with learning disabilities. The tests also allow analysing several cognitive abilities as memory, sequencing, etc.

Raven Progressive Matrix.

This test evaluates non-verbal reasoning. It includes a special scale for children, a general one for children, adolescents, and adults; and a third one for adults with a high socio-economic status. Its utility derives from the possibility of being applied to people with low socio-economic status or any linguistic difficulties.

5.2. Specific tests for the assessment of reading and writing.

A number of tests and scales have been specifically designed to evaluate reading and writing abilities. These tests include tasks to assess specific aspects of cognitive functioning. In such a way, the professional could select the most adequate pattern of evaluation for a particular individual. We will describe only two tests of extended use among professionals.

a. Test de Análisis de la Lectura y la Escritura (TALE) (*Test for the Analysis of Reading and Writing*) (Toro & Cervera, 1980).
This test provides a tool to evaluate the level of acquisition of different reading and writing skills of 6 to 10 year-old children. It includes a wide range of tasks that evaluate from the simplest abilities, as letter or syllable reading, to the most complex ones, as text writing and comprehension.
The test is divided into two parts: reading and writing. The reading part consists of 5 subtests: letter reading, syllable reading; words reading; text reading, and text comprehension. For text reading and comprehension, different selections are provided to be selected as function of the child's school level. The writing part includes 3 subtests: copying; dictation; and spontaneous writing.

Through the analysis of the responses, the practitioner could obtain a clear picture of the child's reading and writing abilities and identify the kind of "anomalies" that characterize his/her performance. The objective of evaluation is not only to understand the child's level, but also his/her reading fluency and intonation; the kind of reading and writing errors, the quality of writing, etc. Specifically, this information would be essential to design a program for intervention.

In spite of its utility, the problem of TALE is that its administration takes a long time and it could be tedious, mainly by those children who have difficulty with reading or writing tasks.

A new version appeared called **Escalas Magallanes de Lectura y Escritura (EMLE-TALE 2000)** (*Magallanes Scale for Reading and Writing*) by García & Urío (2002).

This version presents some interesting innovations. First, the age of application has been widened to 15 years. It also includes a computerized form for the report of results. Finally, the subtests have been reduced to five: Reading aloud, Letter identification, Text copy, Dictation, and Reading comprehension. With the exception of the reading task, the test permits a group application that lasts a mean of 1 hour and 30 minutes. Following the same approach as TALE, the level achieved (in numeric terms) as well as the quality of performance, evaluated.

b. The Cognitive Approach
Under the cognitive approach, the linguistic system is conceived as a structure composed by subcomponents that work with a relative independence. The function of each component proceeds through different operations, and processes different pieces of information. From this perspective, the system is characterized by the specialization of its components. Consequently, the objective of evaluation is to determine which

process is causing the symptoms (Sánchez Bernardos, 1992; Cuetos, 1999; Ostrosky, Ardila & Rosselli, 1999; Roch-Lecours, Dieguez, Boehm, Tainturier, Gold & Peña, 1999).

The tests constructed under this frame include tasks that allow discriminating not only the strategies used by the subject to obtain the response, but also the missing mechanisms or those with a wrong functioning.

Evaluación de los Procesos Lectores - PROLEC I y II (*Reading processes evaluation*) (Cuetos, Rodríguez y Ruano, 1996).
This is a test for individual administration. The PROLEC I is addressed to children from 1st to 4th course of the primary education (6-9/10 years). PROLEC II evaluates children in the 5th and 6th, even older. However it is a useful tool to evaluate older subjects with reading disabilities. The test contains four groups of tasks: letter identification, lexical processing, syntactic processing, and semantic processing. The most interesting tasks are letters and words reading because they allow to the determinant of the kind of mechanisms involved in the child's difficulty.

The core of the test is constituted by 6 tasks addressed to the assessment of lexical processing: two *letter identification* tasks; a *Lexical decision* task; a task of *Word*, and other of *Pseudoword reading*, a task of *Word and Pseudoword reading*. There are also additional task of semantic, syntactic and text processing.

The advantage of this test lies in that it indicates the most efficient route by computing the errors in reading words and pseudowords, and it includes some concrete suggestions for intervention based on the deficits found.

c. Tests for the assessment of Linguistic Abilities caused by neurological damage.

There are some tests that are not specifically designed for the evaluation of reading and writing, but we include these type of tasks because their objective is to evaluate the preserved and lost abilities of patients with the certainty or suspicion of a neurological disorder. There are several reasons for use of these tests. One is that they cover a wider age range (they could be applied to adults). Anther is the possibility to assess other aspects that could interact with language abilities. In other cases, the objective of the practitioner is to reject, or confirm, the neurological origin of the patient symptoms. The practitioner selects the subtests that are better adapted to the objective in a specific assessment context.

Programa Integrado de Exploración Neuropsicológica. Test Barcelona. (*Integrated Program for the Neuropshychological Exploration*) J. Peña Casanova. (1990).

This is a test well known in medical environments and which is frequently used because of it wide scope. It is thought to be used with adult patients but it is also suitable to be administered to children older than ten years. It contains forty-two subtests out of which eleven are focussed on oral language, and three on written language. The analysis of the patient's responses provides an overview of his/her linguistic abilities, and it allows knowing if there are any other (neurological) alterations. The problem is that the practitioner needs some training to become familiar with the test, and to be able to capture all the information it provides.

Evaluación del Procesamiento Lingüístico en la Afasia (EPLA). Spanish Version of PALPA. J. Kay, R. Less; M. Colthert; F. Valle & F. Cuetos (2000). This is a very complete text that assesses text comprehension. The objective of the authors was to produce a tool for the independent assessment of the many different abilities involved in language comprehension and production. Their intention was to detect what specific processes work properly and which ones could be causing the symptoms. The test contains 58 different subtests. Obviously, it is not constructed to administrate all of them to the same patient. On the contrary, the idea is to follow a research like strategy, as it is usual in many diagnosis processes, proving the patient's performance in some tasks to accept or reject the professional's hypotheses about the nature of the problem shown by the patient.

In every subtest, there is a description of the task, suggestions of tentative explanations of the patient's performance and an orientation about how to proceed next in order to check hypothetical diagnosis. For instance, if the patient fails in the visual pseudowords lexical decision, the manual suggest letter processing and word reading. If the patient finds no problems to answer, it is advisable to go further in the exploration of lexical processing by the administration of other lexical decision subtests.

The main problem with this test is that the practitioner should be familiar with the cognitive approach, and need some practice to handle it with ease. Nevertheless, the instructions are so clear that a novice could manage planning the sessions in advance.

Boston Diagnostic Aphasia Examination. Spanish Adaptation García Albea, J. E.; Sánchez Bernardos, M.L. & del Viso, S. (1986).
This is an instrument to assess the performance in different linguistic tasks, and provides a profile that classifies the patient according to the perspective of the classical neuropsychology. It assess 34 verbal and 10 non verbal variables. The special interesting are the subtests addressed to the evaluation or writing language: word reading, sentence reading, paragraph reading, letters and written word discrimination, and tasks of copying, dictation, and composition. As the tasks are independent, it is possible to administer the most specifically related to the patient difficulties.

6. Technological, financial support and other type of actions.

6.1. *Technological support*.

At present there are not technological instruments to support Spanish people with reading and writing difficulties. One resource is to tape lectures in order to avoid difficulties in note taking. Dyslexic students could also exploit resources used by the general population, such as the spell-checkers of word processors, and other instruments designed for special populations. This is the case of some word-readers used by blind people.

Nevertheless, the most useful instruments are computerized procedures designed to train people, with or without special difficulties, in reading and writing. These procedures have being created as training rather than support instruments. Nevertheless, they could be useful instruments to train specific deficits. For instance, there exist computerized programs to train syntax composition, letter and word reading, or naming (Ardila, Ostrosky-Solís & Mendoza, 2000; Adrián, González y Buiza, 2003). The problem is that this software is expensive and difficult to obtain for individual use.

6.2. Exams and study facilities, and personal supervision.

School teachers are aware of reading difficulties, although not always trained to treat students with special needs. However, neither personnel in administration nor teachers expect students with cognitive or learning difficulties at Secondary and High school, and less at the University. In this last case, teachers are not concerned with the problems of dyslexic students following lectures, take notes or to answer multiple choice exams. The provision of special material or supervision is a personal decision to take by the teacher.

Unfortunately, there are no special facilities for students with reading and writing difficulties. Written exams have to be passed in order to enter the University, and there is no possibility of adaptation in the case of reading or writing difficulties.

Once the student has entered at the University any adaptation to the general procedure is at the teachers' discretion, since there is not any official provision over students with special needs. Some teachers will comprehend the student's difficulties and be available to provide any help, although the general attitude is to ignore individual conditions.

6.3. Non-technology and training support.

In some Universities there is a Service of Psychological Support constituted by Psychologists and Speech Therapists. This is free for University students, however the treatments are only provided during short periods.

The dyslexic can visit to find support for his/her difficulties, although not every Psychological Service in Spanish Universities recognises this kind of disorders.

6.4. Financial support

Students who have been diagnosed as dyslexic could only apply for support from the Orientation Team or the Counsellor at the school. However, there is no financial support. If the dyslexic arrives at the University, he/she would not have access to financial or technological facilities.

As dyslexia is not considered a disability, dyslexic students could not apply for special grants or financial support but have access to the same ones as non-dyslexic student.

6.5. Other

The interest in people with difficulties is increasing in the Spanish society. Authorities are more conscious of the need to establish strategies to give support to the citizens with any kind of disability. Many advances have been introduced through legislative provisions, mainly for people with sensory or motor impairments, and cognitive deficiencies. However still more facilities are needed, as the creation of services to attend students with dyslexia or learning difficulties in High Education Centres and at the University. Nevertheless, small changes have been observed. For example, very recently the General Direction of Traffic has edited a Driving Manual for people with reading comprehension difficulties. We hope this innovation would be extended to other aspects of the public life, such as the construction of official forms that need to be filled out.

7. Web sites.

The webs dedicated to dyslexia belong to associations and other professionals whose work is centred on this topic. Some of them are very informative, and offer strategies for intervention. But most of them are not very helpful, since their aim is mainly advertising. There are still other webs with an old fashion approach, and even some that present dyslexia as a “precious value”, which could get parents confused. We list below a selection of the most interesting webs.

- Centro de Estudios de Aprendizaje y Reeducación (CEAR) (*Center for the Study of Learning and reeducation*). It is a non-profit private foundation recognized by the Ministry of Education for the help of people with learning difficulties in Spain.
www.dyslexia.org

- Problemas del Aprendizaje. (*Learning Difficulties*). A place to generate a community around dyslexia as a learning difficulty.
http://www.geocities.com/jesus_rua/dislexia.html

- **Asociaciò Dislexia i Familia**. (*Dyslexia and Family Association*). Association constituted by parents and professionals who work in dyslexia and try to look for solutions to their medical, and educative difficulties in the city of Palma de Mallorca.
http://www.disfam.com/

- **Fifteen basic questions on dyslexia**. By Dr. Josep Artigas. A document that sets and answers the most common questions in a very comprehensible language for non experts, and updated with the most recent research.
www.cspt.es/

- **Asociación para la dislexia y otros problemas de aprendizaje.** (*Association for dislexia and other learning difficulties*). This is an association formed by parents, and teachers who attempt to spread the knowledge about dyslexia, and to claim for more support. The problem is their old fashion conceptualisation of dyslexia.
www.dislexia.net

- Estrategias de intervención en niños con dificultades de aprendizaje. (*Strategies for the intervention on learning difficulties*) Specialized document elaborated by the Department of Psychology in the University of Oviedo.
http://copsa.cop.es/congresoiberoa/base/educati/a9.htm

Other interesting web-sites localized out of Spain

- **La conquista del Lenguaje.** (*The Conquest of Language*)
A private centre for the study and treatment of the dyslexia.
www.ladislexia.com

- **La Dislexia en el niño**. (*Dyslexia in the childhood).*
Introduction of C.I.L.A. (Interdisciplinary Centre of Language and learning). Argentina.
http://www.dislexia.com/ninho.html

A SURVEY. Reading and writing difficulties in High School and University students.

Several researches address the study of reading difficulties showed by 6 to 12 year-old students (Jiménez y Hernández, 1999; Justicia, Defior, Pelegrina y Martos, 1999). Even when there are some studies about reading comprehension in Secondary and High school students (García Madruga,

Elosúa, Gutiérrez, Luque, y Gárate, 1999), little is known about the Academic progress of students with reading and writing difficulties: if they enrol in the university or they opt to vocational training, and direct towards finding a job.

It has been shown along the text above that there is a certain gap between what it is suggested by the law and the reality at the education Centres. Parents, teachers, and other professionals inside the educative field are aware of the necessity of strategies to prevent or to compensate learning difficulties, especially those related to reading and writing. Against these expectations, there is a little provision of professional and instrumental means, and it tends to disappear at higher levels of education. In Secondary and High Schools, the duties of educative support are reduced to minimum, so that counsellors use most of their time in vocational orientation or attending the most difficult cases of social adjustment (Luque y Mora, 1999). Students lacking in resources are deprived of support just at the time when school tasks are more demanding. As a consequence, they could find more difficulties to achieve standard levels. In such a situation, what happens to intelligent students that, due to their poor reading and written abilities, fail to achieve beyond a low general achievement?

There is an additional matter to take into account. The law of Education establishes the compulsory of education until the age of 16 years. It means that students with low achievement, who would have preferred to initiate their working life, continue at school. However, they find little help to take on what they could consider tedious or difficult tasks. Thus, the difficulties would be emphasized, and the gap between good and poor students would increase.

The purpose of this survey was of an exploratory nature. We pursued three general aims. First, we attempted to know the proportion of reading and writing difficulties in Secondary and High School through the information provided by School Counsellors. Second, we proposed to know the vocational advices these students received; and third, how many of them, finally, entered at the University.

The survey we are going to present consists of two studies. In the first, data were taken from a sample of Secondary and High School Counsellors by a questionnaire. For the second study, a questionnaire was used directly with a sample of University first year students. By examining the participants responses, we hope to understand the academic progress of students with reading/writing difficulties, and their options to enter into University.

Study 1.

In this first study, it was intended to question counsellors about the percentage of student with low reading/writing abilities, and about the kind of actions planned from the Orientation Department.

Participants: A sample 21 counsellors coming from the same number of Secondary and High Schools settled in Málaga city answered to a questionnaire. This number constitutes 68% out the Secondary and High Schools in Málaga city. The socio-economical and cultural level and quality of education distribute randomly among the Centres that participated in the study.

Procedure: A questionnaire was elaborated and individually administered to the head of the Orientation Department (see Appendix I). The application took place at every Centre between the months of November 2003 and January 2004.

Results and Discussion.
The percentage of students that following the counsellor's opinion manifest reading-writing difficulties is shown in Figure 1. Most of the counsellors inform of high percentage of students with any reading/writing difficulties. In one out of three High Schools, the percentage of students rage between 10% and 20%. It is interesting that in 24% of the Centres the counsellor considers that almost a third part of the students (30%) manifest this kind of difficulties.

Please, insert Figure 1 here

However, very few students consulted for their difficulties, and the counsellors considered only a very low proportion follow any kind of treatment.

When counsellors were asked if there was any planned activity to prevent or re-educate this kind of difficulties by the Orientation Department only 24% of the answers were affirmative, although 50% of them admitted the Centre counted with enough resources to this aim.

Table 1. Vocational counselling and decision taken by the student

	FURTHER STUDIES			LOOK FOR	A JOB
	Secondary and High School	**Vocational Training**	**Secondary and High School or Vocational Training**	**Vocational Training or Job**	**Job**
Vocational Counselling	28,6%	28,6%	33,3%	9,5%	
Students' choice	23,8%	4,8%	33,3%	28,6%	9,5%

Of special interest it was the answer to the question about the type of vocational orientation given to these students, as it is showed in Table 1. Most of the counsellors tend to advise to take further studies, either Secondary and High school either Vocational Training. Just a few (9.5%) considered that looking for a job was the best option.

In the counsellors' opinion after their advice a 61.9% enter in Secondary and High school or Vocational Training, 9.5% look for a job; 28.6% could opt either for vocational training or for finding a job. As it could be observed, the counsellors encouraged students to progress in the studies. It is the personal option of the student to leave the school.

If these predictions are fulfilled, there is a remarkable percentage of students with reading/writing difficulties that will enter at the University.

Study 2.

In the second part of the study we attempted to detect the proportion of students who, in spite of their difficulties, chose to enter at the University. We also seek to know if their difficulties determined their election. As a consequence, we expected an elevated proportion among the students of science courses.

Participants: 1255 students of first year, 360 male, 865 female. The mean age was 20.26 years. The students were distributed along 20 different courses at the University of Málaga. This constitutes the 38% of the total studies given by this University. 4 were science courses, 13 "Arts" courses; 3 mixed courses.

Procedure: The questionnaire included in the Appendix II was administered to all participants. The questionnaire was collective applied between November 2003 and February 2004 in the same class were the courses were given.

Results and Discussion.

A total of 213 students (17%), 145 (16.8%) female and 68 (18.8%) male, identified themselves as showing any kind of difficulties in reading, writing or

calculus. This percentage is close to our expectations from the data obtained in the first study.

If we look at the type of difficulties students admit to manifest, as it is showed in Figure 2, the most common is the necessity of *slow reading* (33.5%), *misspellings* (24%)*, and difficulties for reading comprehension* (15%). It is worth noting that these difficulties are not necessarily related to a severe difficulty, but they could point to poor learning, and lack of training.

Please, insert Figure 2 here

In relation to their learning history, 63% said they could read correctly at 7; 17% at 8, and 7% at 9 years. The 13% considered their reading and writing were not correct after 9 or more years.

Only 7% consulted to a specialist. However, 21% admitted to have been diagnosed of dyslexia (5%), dysgraphia (7%), dysorthographia (7%), Dyscalculia (1%) and other difficulties (1%). The discrepancy between these two assertions brings us to believe that it was accepted as valid the "diagnosis" established by any professional non specialists (a teacher, the family doctor, etcetera).

To the question if they have received any treatment for their difficulties, 11% responded that the treatment lasted 1 or 2 years (7%), for 3 or 4 years (3%), or for a period equal or longer than 5 years. When the responses to the last two questions are compared it is observed that while the 21% manifested having been diagnosed, only half of them received specialized treatment.

The distribution along the courses, as it is shown in the Figure 3, it is surprising the high percentage of students of Educational Science with difficulties: almost half of the students who fulfilled the questionnaire (43%) manifested to have any type of difficulty. A possible interpretation is that the contents of their courses could have made them aware of the possible difficulties, and inclined to make lower self-evaluation than other students. Nevertheless, to make us sure of this interpretation we decided to analyse the answers to related questions that could proportion a clearer view.

First, high percentages of difficulties were also found among science, and mixed students, as it could be observed in Figure 3. The most relevant are Primary Education 26%; Informatics management 23.7%; Work Consultancy 23.5%; Music education 22.7%, and Geography 20%.

Please, insert Figure 3 here

In the second place, the analysis of responses to the question about previous diagnose showed again the highest percentage among the students of

Educational Science. 21 out 33 manifested having been diagnosed of dyslexia, dysorthography or dysgraphia. However, the number was also very elevated among students of Informatics management (4 de 18) and of Geography (2 de 4). To get a general overview, please see Table 2.

Tabla 2. Number of students with previous diagnosis by course.

Studies	**Dyslexia**	**Dysorthography**	**Dysgraphia**	**Dyscalculia**	**Other**	**TOTAL**
Educational Sciences	2	6	12	1		21
Child Education		3			2	5
Special Education	1					1
Primary Education	1			1		2
Speech therapy	1			1		2
Work Consultancy	1					1
English Philology	1					1
Medicine	1					1
History	1					1
Geography		2				2
Telecommunication		3				3
Informatics Management	2		2			4
TOTAL	11	14	14	3	2	44

It may be possible that the high percentage among the students of Educational Science indicates that the students' difficulties could have determined their decision about what to study. In fact, students from 12 courses recognized the influence of their difficulties when they had to choose the courses to study (see figure 4), belonging to Educational Science the highest percentage (24%), followed by Geography (10%), Telecommunications (6%), Informatics Management (5%), and Primary education (5%). It could be said that the influence of having difficulties is twofold. Some students are interested in their difficulties so that opt for those courses that could provide further information, and possibly some solutions. Others follow a different strategy: they try to avoid courses with reading/writing demands, studying science subjects. This last idea is supported by the almost absence of students with difficulties in the *linguistically demanding* courses as philology or philosophy.

Please, insert Figure 4 here

A plausible interpretation is that the final decision could be taken having into account their average marks. Thus, we related the limit mark to be admitted into each course with the number of students who manifested difficulties. We obtained a significant correlation (r = 0,28, p< 0.05). As it was expected, 118 (55%) out of 213 with difficulties were enrolled in course in which 5 (the minimum mark to pass an exam) was the limit mark. Anyway, there was still 41 (19,2%) students in courses with limit mark above 6.10.

Conclusion.

The study we presented above has a twofold aim. First, we attempted to know the situation of the students at the time to decide whether taking further studies or looking for a job. Second, we wanted to know the amount of students who finally decide to enter at the University.

The counsellors' responses showed that to continue with studies is the most valued option. However, there is no plan to provide support the students with difficulties. Neither students, who rarely consult, neither counsellors, who do not establish strategies for compensation, seem to consider reading/writing difficulties important, in spite of 71% of the counsellors considers that more than 10% out of the students at Secondary and High School manifest any difficulty. As a consequence many students enter at the University lacking the abilities to make good use of written information or to express in writing.

Once at the University, the students with difficulties are distributed along different courses, with a higher concentration in the least demanding ones. Nevertheless, some of them choose courses with a predominant content of mathematics. This fact points to that their difficulties have weighted heavily in their decision making.

Finally, the difficulties indicated by the students are not very severe. One possible interpretation is that the students with dyslexia decline to go to the University, the other is that there are only accepted those whose writing abilities are, at least, close to the average.

The findings of this study invite to think carefully about the need to review the Services of prevention and intervention in Primary and Secondary and High School, and the convenience of establishing some facilities at the Spanish University for students with reading or writing disorders. If, as the findings of our study show the difficulties manifested by University students are not very severe, it would be enough with the organization of training and support programs. These programs, as the ones implemented in some North European Universities, will provide support to the students and increase their achievement since their lack of writing resources would be compensated.

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APPENDIX I.
QUESTIONAIRE FOR HIGH SCHOOL COUNSELLORS

A group of researches at the University of Malaga are making an estimation of the amount of students at Secondary and High School with difficulties in reading or writing. More concretely, we want to detect students with any of the following difficulties:

- Mistakes in letters when reading or writing
- Mistakes in words when reading or writing
- Difficulties to understand well when reading
- Slow reading to avoid mistakes
- Frequent misspellings
- Mistakes in the order of numbers

Maybe some of these students have been diagnosed of dyslexia, dysgraphia, dysorthography or dyscalculia, however some others manifest the difficulties although they have never been diagnosed. Please, answer the questions having into account the difficulties named above.

1. In your opinion, what is the percentage of students with reading or writing difficulties in your Centre?

1 5 10 15 20 25 30

2. Do these students go for help to the Orientation Team?

None very few almost everyone

3. Do they consult for private attention?

None very few almost everyone

4. Do teachers ask for advice or remedial training for their students with difficulties?

None very few almost everyone

5. Do you include in your program activities for the training of reading and writing abilities?

Yes No

6. What is your vocational orientation to the students with reading and writing difficulties?

Looking for a job Vocational Training High School

7. ¿Qué suelen hacer cuando terminan la enseñanza obligatoria?

Looking for a job Vocational Training High School

8. Is there teaching material for the training of the students with reading and writing difficulties?

APPENDIX II.
QUESTIONAIRE FOR UNIVERSITY STUDENTS

A group of researches at the University of Malaga are making a census of the people that have, or have had, difficulties in reading or writing.
If you think this is your case, please fill up this questionnaire marking with a circle the option that better describe you.

Age_____ Male-Female Course _____

1. At what age do you read and write correctly?
   6 7 8 9 later
2. Have you consulted to any specialist for your reading or writing difficulties?
Yes No
3. Have you been diagnosed of
Dyslexia Dysgraphia Dysorthography Dyscalculia?
4. Have you received treatment for your difficulties?
¿Ha seguido alguna vez tratamiento para sus dificultades? If yes, for how long?
   No
   Yes 1 o 2 years 3 o 4 years More than 5 years
5. At present, do you still manifest any reading or writing difficulties?
Yes No
6. Please, point to the difficulties you manifest
   You mistake letters when reading writing
   You mistake words when reading writing
   You do not understand well when reading
   You have to read slowly to avoid mistakes
   You need to revise constantly your spelling
   You mistake the order of numbers
7. Have you manifested other difficulties? Please, describe them.

8. Do you think these difficulties have influenced in your choice of courses or profession?

SWEDEN

Bodil Andersson

To complete this report, I have made telephone interviews (in two cases, face-to-face interviews) of roughly 1½ hours each with the coordinators for students with disabilities at 14 higher education institutions (HE from now on) in Sweden. This includes an interview with the national coordinator in Stockholm, Monica Svalfors, who deserves a special acknowledgment.

A questionnaire has also been sent to Swedish HE students with dyslexia through the coordinators for students with disabilities by e-mail or regular mail. About 120 students have kindly responded. Considering that there are about 1500 known students with dyslexia in HE in Sweden, this is a small sample, and probably not representative as it seems that disproportionately many responses came from students who had no ICT support. However, some interesting points have come to hand through the students' questionnaires and they will be presented in the following.

Interviews were made with coordinators for students with disabilities at HE institutions in the cities of Luleå, Umeå, Sundsvall, Uppsala, Stockholm, Eskilstuna, Linköping, Borås, Gothenburg, Halmstad, Kristianstad, Lund and Malmö.

Basic facts about Sweden

Year of entry to EU:	1995
Political system:	Constitutional monarchy, parliamentary democracy.
Capital city:	Stockholm
Total area:	450,000 km² (174,000 sq. mi.) which makes Sweden the third largest country in Western Europe.
Population:	9 million people
Currency:	Swedish kronor (SEK). €1 = 9,12 SEK (Aug 27th 2004)
National Language:	Swedish
Recognised minority languages:	Sami (Lapp), Finnish, Meänkieli (Tornedalen Finnish), Yiddish, Romani Chib (a Gypsy language).

Numbers of students in HE: 340 000 in undergraduate studies 18 900 active
PhD students (study year 2002/2003).

Legislation regarding disability

The Swedish Disability Ombudsman (Handikappombudsmannen, HO from now on) works for people with disabilities, was established in 1994 and is a government authority. The HO monitors the rights and interest of people with disabilities. The foundation for the activities of the HO are the UN Standard Rules on the Equalization of Opportunities for Persons with Disabilities. Sweden has approved the Standard Rules and undertaken to comply with them. The HO was established to monitor how the Standard Rules are observed in Sweden. The Swedish Riksdag (Sweden's legislative assembly and supreme decision-making body; elected by and representative of the people of Sweden) and the Government decide on the functions of the Disability Ombudsman.

The key legislation/documents in the field, include:

a) **The Disability Ombudsman Act and The Instructions Ordinance**, which prescribe the legal background, powers and formal procedural rules, etc. for the HO and the Office of the Disability Ombudsman.

b) **Prohibition of Discrimination in Working Life of People with Disability Act (1999:132)**, which basically aims to eliminate all forms of discrimination of people with disabilities in the area of working life.

c) **Equal Treatment of Students at Universities Act (2001:1286),** which is for instance aimed at making higher education, both entry and study, more accessible in all respects for people with disabilities.

A new law took effect as recently as July 1st 2003. It is The Act Banning Discrimination (2003:307). Basically, this law strengthens the rights for people who may have been discriminated on basis of ethnic origin, religion or other belief, sexual orientation or disability, as the obligations of institutions, associations, employers etc are made clearer. If they fail to fulfil their obligations, they may, for example, be convicted to pay the damages. The new law covers a number of areas in society such as goods, services and housing, the labour market and the licensing of professions.

More information on Swedish legislation agains discrimination can be found at http://www.ho.se/start.asp?sida=348&lang=en and http://www.oppnare.se/fileserver/Engelska.pdf

General view on dyslexia

Dyslexia is generally accepted as a disability in Sweden, but we still struggle with some issues in relation to this. In Sweden, several professional groups are involved in the dyslexia field: psychologists, speech and language therapists (the education of speech and language therapists' in Sweden includes a considerable part on written language) and special education teachers. There is no group equivalent to the UK's "educational psychologists" All these categories carry out reading and writing assessments, using partly similar, partly different assessment tools.

Nothing in Swedish legislation decides which professional group "owns the dyslexia issue" and there is no definition, or cut-off point, which all professional groups completely agree upon. According to Swedish school legislation, there is no need for a certain diagnosis in order to get the help required at school, but still, there are schools where this is asked for.

Different classification systems are used, some are intended for patient registration within the health system; another one is used within the unemployment services etc. It is important to appreciate the difference between descriptive scientific definitions and those used for clinical purposes, or for deciding about access to special education or other resources. For the individual, this situation can theoretically cause some problems, for example if access to remediation and technology requires a "dyslexia certificate". However, most professionals would agree on a definition of dyslexia in line with a well-known, widespread definition by professors Høien & Lundberg (1999)[2] which in essence says that: "Dyslexia is a persistent disorder of decoding the written language, caused by a weakness in the phonological system." This states that dyslexia is a language-based disorder. A recent consensus study among Sweden's 24 PhDs in the dyslexia field, carried out by professor Mats Myrberg of the Stockholm Institute of Education, confirms this view. Having said that, most people in the field appreciate the considerable comorbidity in dyslexia: many of the people with dyslexia, as described by the "core" definition above, would also display related symptoms, such as working memory difficulties or organisational difficulties. There is a growing interest in these possibly related conditions, as well as in dyscalculia and multilingual issues.

According to the National Board of Health and Welfare in Sweden, it is "customary within the health service to have a registered medical doctor or a registered psychologist carrying out the assessment, but anyone with sufficient skills can do it. An assessment requires pedagogical competence as well as qualifications from the health system" [*my translation*]. Note that this

[2] Høien T & Lundberg I (1999), Dyslexi. Från teori till praktik [Dyslexia. From theory to practice]. Stockholm: Natur och kultur publishers.

covers only the custom in the health system. Within the unemployment services, it would normally be a psychologist who assesses; in hospitals a speech and language pathologist, and here the WHO classification system ICD-10 *has* to be used. In schools, there is a variety of solutions and actual practice varies with local conditions. Usually, a trained special education teacher or a school psychologist would carry out the assessment.

In 1990, the FMLS, which is the main Swedish user organisation for people with reading and writing difficulties (www.fmls.nu) with about 6,000 members, was acknowledged as a handicap organisation in Sweden. This means, for example, that any governmental suggestion concerning citizens with reading and writing difficulties is referred to the FMLS for consideration. Quite understandably, this acknowledgment was interpreted as a general acceptance of dyslexia as a disability, but it definitely did not mean that Sweden then agreed upon the fine definitional issues. The FMLS is not an association for “pure” dyslexics; as a handicap organisation it welcomes anyone who finds reading and writing a struggle.

During the nineties, the general understanding of dyslexia was raised considerably in Sweden. Several efforts during the Literacy Year of 1990, as proclaimed by the UN, helped increase the understanding for the reading disabled in Sweden. A successful nation-wide campaign was arranged in 1997 to raise the public’s awareness about dyslexia/reading and writing problems, directed by FMLS and The Swedish Dyslexia Association and others. Many dyslexia resource centres started in the nineties, as did special teacher training courses and courses for psychologists and speech and language therapists. A large number of conferences relating to the field of dyslexia have also been arranged.

Guide to the education system

The Swedish public school system is made up of compulsory and non-compulsory education. Compulsory schooling includes regular compulsory school, Sami school, special school, and programs for pupils with learning disabilities. Non-compulsory schooling includes the preschool class, upper secondary school, upper secondary school for pupils with learning disabilities, municipal adult education, and adult education for adults with learning disabilities.

Historically, private schools have been rare in Sweden. However, in 1992, after a reform which made it possible for private education sites to receive governmental funding, a steady increase of private schools has been seen.

Today, there are 600 private compulsory schools and 273 private upper secondary schools in Sweden[3].

Swedish children start school at age 7, or upon request by the parents, at age 6. After the nine-year compulsory school attendance, most children continue to upper secondary school, which lasts 3-4 years. All education throughout the public school system is free. More information about the Swedish school system at www.skolverket.se/english/system/swedish.shtml

32% of the Swedish population aged 25-64 have completed higher education. There are 38 institutions of higher education run by the state through the Ministry of Education and Science plus 9 semi-private institutions of higher education that are partly run by the state, and also the University of Agricultural Sciences. The major learning sites are located in Gothenburg (31 000 students), Lund (29 000) and Stockholm (26 000). 15% of the students have an immigrant background.

The median age of a Swedish student today is 22:4 years. Higher education is government funded and, with very few exceptions, there are no tuition fees for Swedish or even foreign students. A requirement when applying for higher education, is a pass in the “core subjects” Swedish and English. More about the consequences for dyslexics later in this report.

The Swedish academic year has two terms: Spring term, running from mid January until early June, and Autumn term between late August and early January. Full-time study for one term is equivalent to 20 points, which equals one point for each study week. A Bachelor’s degree requires at least 120 points and a Master’s degree 160. Postgraduate studies can end either in the achievement of a PhD of 160 points or a licentiate’s degree of at least 80 points.

Guide to disability in higher education

At all institutions of higher education in Sweden, there is a contact person/coordinator who works with issues regarding educational support for students with disabilities. The coordinators are annually involved in turning the national policy plan into a plan. More information regarding HE and disability in Sweden can be found at
www.studeramedfunktionshinder.nu/english/
www.heagnet.org

Through contact with the coordinator, a student with a documented disability will have access to compensatory support during the academic study years.

[3] http://www3.skolverket.se/friskola03/friskola.aspx

For a student with dyslexia, this might mean extra time at examinations and note-taking (another student gets paid for this) or using assistive technology. At an increasing number of HE institutions, there is also a dyslexia pedagogue, with whom the dyslexic students can discuss and plan practical study issues such as study organisation.

The tables below come from www.studeramedfunktionshinder.nu/english/

The first table shows the latest statistics regarding disabled students in Sweden. It is obvious that the group who has specific learning difficulties/dyslexia constitute the vast majority. Today, they make 54%[4] of all the students with a known disability, i. e. *those who have contacted the coordinator* – more disabled students are likely found in hidden statistics. In total the recognised students with dyslexia equal about 0,44% of all students (converted into full-time students).

	2003
	In all
specific learning difficulties, dyslexia	1 456
visual impairment	162
mobility impairment	360
deaf students (with interpreter)	149
deaf students (teacher knows sign language)	15
neuropsychiatric disabilities	97
mental illness	141
hard of hearing students (without interpreter)	140
others	157
postgraduate students	21
In all	**2 698**
Students who have been in contact with the coordinator for planning of the studies, without applying for other forms of support	1 457
All in all	**4 155**

[4] In the academic year of 2004, the number had gone up to 58% (personal communication with Monica Svalfors, Dec 21st 2004).

In the table below, the changes and growth of numbers from the start of the statistics in 1993/94 can be viewed through a number of years.

	93/94	94/95	95/96	97	98	99	00
specific learning difficulties/dyslexia	55	99	182	243	322	395	548
visual impairment	85	105	105	101	128	123	144
mobility impairment	91	105	100	95	143	175	207
deaf students (with interpreter)	48	53	87	55	57	68	78
deaf students (teacher knows sign language)	-	-	-	75	60	20	50
hard of hearing students (without interpreter)	30	64	92	92	63	81	100
others	15	38	86	70	110	82	193
postgraduate students	-	-	-	17	18	17	12
In all	**324**	**464**	**652**	**731**	**883**	**944**	**1332**
Students who have been in contact with the coordinator for planning of the studies, without applying for other forms of support	159	254	395	390	431	575	769
All in all	**483**	**718**	**1047**	**1121**	**1341**	**1519**	**2101**

In Sweden, each HE institution has to set aside a certain percentage of their total grant for all undergraduate level education to cover the extraordinary costs for educational support measures of students with disabilities, but please note that ICT costs are *not* to be included here. Between the years 1993 and 2003, the percentage level was 0,15%; as of 2004, it is 0,30%. This means the interviews were carried out while the level was still 0,15%. Additional money can be applied for from Stockholm University, which annually distributes an extra grant to the HE sites where their own funding does not cover their costs for compensatory pedagogical support to individual students.

There are earmarked IT accounts in the HE organisation, but there is no special account for ICT used for special needs. According to the interviews carried out, this earmarked money does by no means cover the costs, but most coordinators say they have to supply what the students are entitled to and therefore, they simply cannot keep their budgets. Especially the interpreters for the deaf students cost a lot, and it would not be fair to, say, refuse a large number of dyslexic students their legitimate service just

because the particular HE institutions happens to have one or two deaf students at the same time.

In the year 2003, the 0,30% money was 22,000,000 SEK (about €2,43 million). NB: This money does *not i*nclude ICT costs at all, only other services such as:

1. Adaptation of course plan or speed of studies
2. Alternative means of examination (oral, at computer etc)
3. Note-taker at lectures (co-student gets paid for doing this)
4. Sign-language interpretor
5. Proof-reading help
6. Study-skill courses
7. Personal mentor

Talking books – a unique service

The Swedish Library of Talking Books and Braille (the TPB) constitutes a unique service. Swedish Copyright Law permits libraries and organisations officially authorised by the government to produce published books as phonograms for lending to people with reading disabilities. This can be done without the permission of authors or publishers. Today, the TPB offers about 86 500[5] talking books and DAISY books. The TPB is also involved in a considerable amount of research and development. More information about the TPB can be found at http://www.tpb.se/english/index.htm .

All dyslexic students in HE have the right to have all obligatory course literature (i.e.
published books) as talking book loans from the Students Service of the TPB. The student acquires an individual ID from the TPB which allows him/her to borrow a DAISY player and have new literature recorded. The coordinator at the HE institution assists students to apply for this ID and service.

Definition of dyslexia in higher education

Dyslexia is accepted as a disability which entitles a student to compensatory support. In the Equal Treatment of Students at Universities Act , the overall definition of disabilities reads:

”Disability: permanent physical, mental or intellectual limitation of functional capacity as a consequence of an injury or an illness that existed at birth, has arisen thereafter or which may be expected to arise”.

[5] June 2004

Documented reading and writing difficulties are within the scope of the disability definition above. However, there is no definition of dyslexia, including sharp cut-off criteria used, throughout Swedish HE. The coordinators and the pedagogues rely on the assessments carried out by various types of professionals – their role is not to be part of the general professional debate regarding clinical cut-offs and definitions. My impression from the interviews carried out is that this pragmatic system seems to function smoothly and satisfactory.

What legislation supports dyslexic students?

The Equal Treatment of Students at Universities Act came into force in the spring of year 2002. This law states that a student must not be discriminated on grounds of sex, ethnic belonging, sexual orientation, or disability. It covers all levels of academic studies and research as well as admission, study environment, teaching and examination and employment, etc. This act puts pressure on all levels of teaching and approach in the HE institutions.

The needle's eye: admission to HE for students with dyslexia

Except for the grades and merits from secondary school, it is possible to enter Swedish HE through a special admission test called the Swedish Scholastic Aptitude Test. It is administered on a certain date twice a year throughout the country. The National Agency of Higher Education allows people who can show a certificate of dyslexia 50% longer time to complete the admission test. They are also allowed to skip one part of the test, which is not included in the real aptitude test, but used by the National Agency of Higher Education for trial purposes only. Various professionals can supply the certificate necessary. Please note that the abilities that must be tested target reading ability only, and the assessment is therefore not to be regarded as a complete dyslexia assessment. It focuses on the reading disabled person's possibilities to complete the aptitude test if given extra time – nothing else.

A special reference group evaluates assessments by psychologists, speech therapists, teachers and doctors who wish to "be on the list" of the National Agency of Higher Education's test administrators. Sadly, some people believe this to be an official list of people with dyslexia competence, which was never the intention. Several well-known and acknowledged experts are *not* on this list, for all kinds of reasons, such as work load.

If one is at the end of one's resources, there is another possibility left: admission on special grounds. Very few dyslexic students enter HE this way and do this, one still has to fulfil a number of criteria: a pass in the core subjects Swedish and English and ususally, a HE aptitude test must have

been completed. If dyslexia is stated as the reason for applying for admission on special grounds, one must show a confirming certificate of dyslexia. Each application is evaluated individually.

Assessment

Who carries out the diagnostic assessment varies with local conditions. It is often a speech and language therapist or a psychologist but can also be a special education teacher. Most coordinators I have talked to would accept a certificate as long as it looks professional and reliable.

There are no formal demands on the qualifications of the assessor, but according to the interviews carried out, a professional background in either speech and language pathology, psychology or special education and experience in dyslexia assessment is required.

Many students already have a certificate stating dyslexia when they contact the coordinator at the university, but this varies with local context. If this is not the case, there are various ways to solve the situation. In some places, money is taken from the previously mentioned 0,30% pot to cover the costs or a dyslexia pedagogue carries out the assessment within the scope of his/her post. Several HE institutions will ask the students to pay by themselves. This may cost between 500 and 2000 SEK (= € 54-219). Often, the coordinator has developed good collaboration with a certain local, external assessor. In some cities, the student can get a certificate through the health service, provided that the student is registered in that municipality. This costs about 150 SEK (= € 16). The main reason why all students don't do this is usually the time factor – the waiting time can be several years in some cities.

Contents of assessment

A typical assessment would contain various Swedish achievement tests of word decoding, non-word reading, reading speed, reading comprehension, free writing, spelling; sometimes also verbal repetition, memory skills and phonological awareness. An example of a commonly used, time-limited decoding test is "Läskedjor" (Reading chains) by Dr Christer Jacobson, which consists of three parts: character chains, word-chains and sentence chains. The student's task is to mark where there should have been a space. A corresponding English example of a "word chain" would be the below:

lightappledrum

Personal history is normally included in the assessment report, with information about any hereditariness, early language development, previous

schooling and support etc. A psychologist's report would often contain a WISC-profile.

The diagnostic assessments are carried out either on site or externally. If the student is seeing an external assessor, he/she will usually visit the assessor's office. If the dyslexia pedagogue at the HE institution does the assessing, the student will be assessed on site.

Provision of support

In Sweden, the assessment of study needs tends to be done in an informal interview situation where the coordinator and the student discuss and create a specification of required support together. Then the student can see the dyslexia pedagogue and the person in charge of the ICT equipment and try different software. Many students knock on the coordinator's door during the first term, or even before starting at HE. Some do not show up until a couple of terms later and indeed, some not until it is time for the big exam paper at the end of the studies.

It is extremely rare for a Swedish student with dyslexia to get a personal computer as a loan through the HE institution. There are two different concepts for providing ICT:
a special "resource room", to which the student has free access, or adapted computers in the common HE library. These different concepts may reflect underlying differences in views (thoughts of special needs and inclusion) but very often, the reason seems to be a financial one.

The HE institutions sometimes lend the student a tape recorder (to tape lectures etc) or a scanner pen. Some have a laptop for loan at exams only.

How do students with dyslexia get to know about their rights?

In order to get support, the dyslexic student has to come forward and contact the coordinator for students with disabilities. But how do the coordinators spread information about their services? This is an interesting question, as traditional, written information, such as a leaflet, may not be the dyslexic student's first choice.

Most of the coordinators I interviewed appreciate the above and inform orally about their services at the general gathering of newcomers at the start of each term. There are of course also brochures, leaflets etc available too. Most HE institutions have a website with special pages for students, where information on disabilities and support is available. One coordinator told me that they had to explicitly state "reading and writing difficulties/dyslexia" as many of the

students with this disability did not think of themselves as disabled, and therefore did not understand that the web information was relevant to them.

I noted that very few web pages with student info are accessible for reading disabled people in terms of allowing for magnification, change of font etc. Very few have server-based speech, which would allow for listening to the website information without a special text-to-speech program on one's local computer. Most of the coordinators I talked to, had not thought of this but agreed that this was an area of concern.

What is the general dyslexia awareness amongst staff?

The general impression from the interviews carried out is that dyslexia awareness is growing, but that the need for information is always present. The Equal Treatment of Students at Universities Act may have "forced" staff members to raise their awareness and knowledge. Many coordinators say that some HE departments have come further than others in this regard. In a few HE institutions, there seems to be a particular "difficult" department, where students with dyslexia are not treated as well as they should – assumably becauae of lack of knowledge and understanding. Uppsala university has created and published a booklet called "Teaching accessibly" which gives teachers tools for adapting their teaching in general terms.

Availability and costs of ICT

The 14 interviews and the student questionnaires show that the local ICT conditions for students with dyslexia do vary. At some HE institutions, there is still no ICT support available, although under way. At other sites, the ICT support seems to be well developed and thought-through.

What is used can be seen below. The estimated prices in Euros[6] below apply for single user licenses. Often, HE institution asks for an offer for multiple licenses or, indeed in some cases, campus licenses, which brings down the costs per user considerably.

1. Talking course books/literature	Free
2. DAISY players	Lent from the Swedish Library of Talking Books and Braille
3. Text-to-speech systems	€ 87- 1250
4. Spell-checker for dyslexics	€ 81,5
5. Digital dictionaries	€ 108-150

[6] Conversion per Aug 27th 2004 . 1 € = 9,12 SEK.

6. Scanners € 43-430
7. OCR software (to use with scanner) € 180-678
8. Scanner pens € 126-328
9. Speech recognition systems € 615-1095
10. Word prediction programs € 109
11. Tape recorders € 40-50

(Intelligent search methods, allowing for severe misspellings – presently available at www.ne.se, the The Swedish National Encyclopaedia. A Swedish-influenced spelling like ”körkil” will guide the user to ”Churchill”.)

From the interviews and student questionnaires, the most commonly used kinds of ICT in use by dyslexic students in Swedish HE today seem to be:

1. Talking books (no burden on the HE budget)
2. Special spell-checker
3. Text-to-speech systems (+scanner with OCR software)

The least used type of technology seems to be speech recognition and word prediction, which is hardly in use at all. So far, there has been no Swedish concept-mapping software available. Recently – after the research for this report was completed – one program has entered the market. It was noted in the students' questionnaires, where concept-mapping software was mentioned, that very many students expressed an active interest in this, asking for more information, writing that organisation tools was greatly needed. Some even called up to hear more.

Entering and completing HE for a dyslexic person in Sweden: possibilities and obstacles

According to the coordinators I have talked to, the major obstacle for first entering HE for dyslexic people in Sweden is lack of previous support. This often leads to lack of self-esteem and/or grades that are too low to apply for HE. A 19-year-old who has struggled throughout school, yet faced failure a lot of the time, is likely to rule out the chances to succeed in HE. Some coordinators also mention the role of the English language, being one of the core subjects which one must pass to be able to apply for HE. For many Swedish dyslexics, written English is almost impossible to master.

Regarding the chances to succeed in HE, several of the people I interviewed, expressed a very positive outlook. They see continuous improvement and facilitation for the students with dyslexia year by year and in this context, they all highlight the role of the teacher's knowledge and understanding. According to the coordinators, a vast majority of the teachers genuinely *want* to help, but don't always know how to. Many of the coordinators spend a lot of time on teacher information in general terms, as a “preventive measure”. When it comes to particular reasons, i e regarding a certain dyslexic student, most of

the coordinators prefer the student to solve the situation with the teacher(s) himself/herself, arguing that they are adults and the coordinators should not take the reponsibility for them.

The main obstacles for completing HE seem to be:

1. The student not accepting having a disability, trying to hide it or make it anyway by working extreme hours (which eventually lead to collapse). The coordinators say that an open atmosphere is a must for successful cooperation.
2. Talking books not delivered in time. If a course book is already available as a talking book, it is normally delivered within a week, but if not, and the book has to be recorded, it could take up to 8 weeks. This means the teachers need to specify the literature lists a long time in advance, which far from all teachers see as a realistic demand
3. The amount of literature to be read in itself. Screening and skimming is hard for the majority of students with dyslexia, who tend to read everything, word by word.
4. English course literature is a reality in most courses. This can cause serious problems for many Swedish dyslexic students.
5. Sudden changes in a specified literature list, for the same reason as above.
6. The odd “difficult” teacher who seems to find helping dyslexic students a burden.

What training is available for tutors to ensure dyslexia friendly delivery?

So far, there is no special course or the like. As said previously, the coordinators continuously “train” the staff, indirectly and sometimes directly (or the dyslexia pedagogue does this). Several of the staff I interviewed expressed an interest in a course on dyslexia friendly delivery for ordinary HE teachers.

Are there web sites to support the teachers?

No, none so far, though many coordinators found this a very good idea.

...and what do the students think?

As was said in the beginning of this report, about 120 students have completed and returned a simple questionnaire about ICT support. The questionnaire contained questions about what ICT (hardware and software) they had access to, how it was funded, what they thought of it, what (if any) training they had had in using the equipment, and what ICT they did not have,

but may be interested in. There were also some questions regarding how much the students thought using ICT had helped them, plus some space for personal comments.

The overall impression is that the students who have ICT access are relatively pleased with it, but many address the wish for personal, portable equipment rather than sharing computers on site. Receiving the course literature as talking books is greatly appreciated by almost all the students who have responded. Several students also mention using tape-recorders, special spell-checkers and text-to-speech systems. Very few have had training in the use of the equipment they use, but they are not complaining – maybe the equipment is easy enough to master on one's own?

Quite a few of the students have purchased software with their own money. Here are some positive student voices:

> "Without the ICT, I don't think I would have made it."
>
> "I would be lost without my spell-checking software."
>
> "The support and ICT is crucial. There is a great risk of giving up without this."
>
> "I am so glad the Talking books library exists and that I can have my course literature on CD-Rom. That is such an efficient tool for me. Would like a computer with a good spell-checking program."

Many students express an interest in concept-mapping software, which was not available in Swedish when the questionnaire was sent out.

There are also some critical voices and suggestions for improvement:

> "The opening hours of the resource rooms are not adapted to the individual. Also, I have kids and must study late at night – at home!"
>
> "I have no idea what ICT is available. What the university has offered me is writing help which I use (...) but I would prefer to do without that, if there is ICT that can do the job instead."
>
> "A personal laptop (...) could be adapted and used in a way a stationary computer that several people use can't. A laptop is portable and can be used in different rooms, for example doing group projects."
>
> " I think dyslexics should be allowed to borrow a laptop while studying (...) because it takes longer for a dyslexic."

Surprisingly many of the responding students state that there is no ICT available at all to them. This may be true, as disproportionately many of the students responding come from HE institutions that have not yet started their ICT activities full scale. My interpretation of that is that the students who still have responded are very keen and eager to “get going” and some explicitly say so too. Some state, quite rightly, that it is impossible to judge what they “would like to have” when they have no idea what the software and hardware opportunities are.

UK – an overview of provision

Helen Ball, Pete Rainger and EA Draffan

Introduction

The United Kingdom which includes England, Wales, Scotland and Northern Ireland entered the European Union in 1973 and the figures provided in this chapter reflect the nation as a whole rather than as individual entities. "The UK population has grown nearly 20% since 1950. There were an estimated 59,553,800 people living in the UK by mid-2003 (59,787,000 estimated at mid-2004), and numbers are still rising. UK population is growing by the equivalent of one whole city every year."[7] This obviously has a huge impact on the numbers of students entering higher education along with the Higher Educational Funding Council's drive to widen participation with the aim to recruitment and retain students from under-represented groups.

"It's been suggested that getting 50 per cent of 18-30 year olds into higher education by 2010 is either wrong or impossible. The fact is that the target is tough but it is achievable. It is not an act of political correctness, but an ambition driven by economic necessity. Universities must do more themselves to 'hunt down' potential talent in secondary schools in disadvantaged areas with the aim of boosting the numbers of suitable students that eventually apply to their campuses." [8]An excerpt from a speech by the minister for education The Rt Hon Margaret Hodge February 2004).

According to government statistics; "The number of enrolments by men on all undergraduate courses more than doubled between 1970/71 and 2000/01. For women the increase was even more dramatic, with nearly five times as many enrolments on undergraduate courses in 2000/01 as in the early 1970s. In 2000/01 there were 2.1 million students in higher education, 55 per cent of whom were women."[9] Within this demanding context, pressure has also been applied to institutions to improve accessibility for disabled people including those with specific learning difficulties and dyslexia. This pressure has been further increased by the changes in legislation with the amendment to the Disability Discrimination Act.

According to research carried out by Tinklin, Riddell and Wilson (2004) the proportion of disabled students declaring dyslexia almost doubled between 1995/6 and 1999/00. It is likely that this reflects increased incentives to

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[7] http://www.optimumpopulation.org/opt.more.ukpoptable.html

[8] http://www.educationet.org/z0144.html

[9] http://www.statistics.gov.uk/StatBase/ssdataset.asp?vlnk=5027&Pos=1&ColRank=1&Rank=272

disclose dyslexia over this time period.[10] They do not provide figures but the University and Colleges admissions services states that 317,587 disabled students were accepted to attend higher educational institutions in 2003 and of that number 8,866 had a specific learning difficulty.[11]

Legislation

The Disability Discrimination Act (DDA) protects disabled people. The Act sets out the circumstances in which a person is "disabled". It says you are disabled if you have:

- a mental or physical impairment
- this has an adverse effect on your ability to carry out normal day-to-day activities
- the adverse effect is substantial
- the adverse effect is long-term (meaning it has lasted for 12 months, or is likely to last for more than 12 months or for the rest of your life).

There are some special provisions, for example:

- if your disability has badly affected your ability to carry out normal day-to-day activities, but doesn't any more, it will still be counted as having that effect if it is likely to do so again
- if you have a progressive condition such as HIV or multiple sclerosis or arthritis, and it will badly affect your ability to carry out normal day-to-day activities in the future, it will be treated as having a bad effect on you now
- past disabilities are covered. [12]

Part Four of the DDA that became known as the Special Education Needs Act (SENDA) came into force on 1st September, 2002. From that date, schools and post-16 education providers were obliged not to treat people less favourably without justification and (to a significant extent) make reasonable adjustments to all aspects of the teaching and learning environment. Some aspects of the provision for all education institutions already came under the goods and services rules such as public access areas like libraries.
Part Four extends to examinations and assessments, and to non-educational aspects of university life such as outings and field trips as well as on-line learning.
The act covers all types of disability including specific learning difficulties and dyslexia.

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[10] http://216.239.59.104/search?q=cache:P-gAKzKkK-UJ:www.ces.ed.ac.uk/PDF%2520Files/Brief032.pdf+number+of+students+in+higher+education&hl=en

[11] http://www.ucas.com/figures/ucasdata/disability/index.html#show

[12] http://www.drc-gb.org/rights/definition.asp

Dyslexia – is there a single definition?

There are numerous definitions for dyslexia and a few have been listed below:

National Working Party 1995
'Dyslexia is a complex neurological condition that occurs in approximately 4% of the population, and which primarily affects acquisition and use of written language, memory and organisational skills. It is a legally recognised disability, and there is strong evidence that supports a genetic causation of the condition.'

The British Dyslexia Association's working definition of dyslexia, refers to "difficulties which affect the learning process in one or more of reading, spelling and writing". The definition goes on to give "accompanying weaknesses", including short-term memory, spoken language and motor skills.

British Psychological Association (1999)
Dyslexia is evident when accurate and fluent word reading and/or spelling develops very incompletely or with great difficulty.

The issues arising with the variation in definition let alone satisfactory descriptive titles, so that some one who is dyslexic may also be described as having specific learning difficulties (SpLD), make accurate and relevant assessment even harder, especially at higher educational levels. Students have often developed successful coping strategies which may not break down until the stresses of actually attending university occur. Independent learning has to be accepted as part of an individual's organisational skills along with successful time management and controlling information overload. So an assessment or acceptance that they are issues may not occur until after the first year at university.

Diagnostic Assessment

Across the country the debate at to who should carry out an assessment in order for a dyslexic student to gain specialist support, technologies and extra time for examinations is still in state of flux. It may depend on who requires a copy of the assessment and whether it is carried out in order to claim funds.

The ruling for Local Educational Authorities (LEAs) has been developed by the Department of Further Education and Skills and a Quality Audit Group, but the criteria has yet to be agreed (2004). The advice of a 1995 working party has been accepted but usually an educational psychologist has to provide a full WAIS test or a specialist tutor may provide an assortment of tests if this is acceptable to the LEA.

Educational Psychologists have to have some teaching qualifications and a specialist tutor is required to have a diploma in dyslexia or SpLD from certain validation bodies which tend to be linked to a university or board. However, there is no requirement for these specialists to be working in a higher educational setting or to have knowledge about the type of learning materials that the student will meet on a daily basis. There are often delays is getting appointments and students may find that they are liable for the costs of the assessment as it is seen as a diagnostic test rather than an assessment of need that can be supported through the Disabled Students Allowance(DSA). There are time when universities are willing to help out with the costs of in-house assessments often using their own members of staff.

The tests used during the assessment tend to target cognitive processing skills by use of a battery of tests. The Wechsler Adult Intelligence Scale (WAIS) with Wide Range Achievement Test (WRAT) and other tests may be part of the battery. Many psychologists will also include specific tests for spelling, reading ability and phonological awareness for example the Test of Word Reading Efficiency (TOWRE) or Phonological Assessment Battery (PhAB). A personal and educational history is taken and advice may be given regarding some study skill strategies. The assessments tend to take place in the educational psychologist's offices or at the university.

If the results of the assessment show that the student is dyslexic and the report is sent to the Local Educational Authority (LEA) supporting the student through his higher educational course, the next step may be to apply for funds through the Disabled Student's Allowance. If the student contacts the LEA then they will be given a choice of centres to attend and some colleges have the literature from the DFES available - Bridging the Gap http://www.dfes.gov.uk/studentsupport/students/stu_students_with_d.shtml But in reality if the student has not told anyone about the difficulties they have then there is very little chance of them learning about the support available until they go to the student services in the university.

The Disabled Students Allowance.

This is an award to the individual student from the Department of Education and Skills. It is managed by the LEA and it is made up of four parts that are intended to cover any extra costs or expenses the student incurs whilst studying that arise because of a disability. "The allowances are not intended to pay for:

- disability-related costs that would have occurred whether the individual is a student or not;
- study costs that every student might have.

There are four allowances to cover different areas of need:

- Specialist equipment allowance
- Non-medical helpers' allowance
- General/other expenditure allowance
- Travel costs

DSAs are not paid in set amounts, but are needs based. The student receives a grant to cover the cost of specific items of equipment, specific support worker costs, and so on. However, there are maximum amounts for each allowance.

The DSAs are not means-tested, so students receive them regardless of the family or individual's income.

There are no 'previous study' restrictions or age limits on eligibility for a DSA." (adapted from the Skill information sheet[13])

Once the LEA has agreed that the student may receive this allowance it will request that a study needs and strategies assessment is undertaken. This is carried out by an accredited assessment centre that approves assessors under the Quality Assurance Group's guidelines at present being developed - for more information please check this website at regular intervals http://www.dfes.gov.uk/studentsupport/dsa_.shtml

The report written by the assessor after and interview with the student covers all aspects of prior educational difficulties and discusses where the student may feel there will be problems in the future. A good assessor also checks for skills and abilities that can be mapped against the use of assistive technologies and finally offers extra time for examinations, additional funding for say extra photocopying and possibly books etc

The exam provision needs to be discussed with the student's institution as these may vary across the country. There also needs to be discussion about specific learning environments, likely field trips, outings and work placements. Study skills support usually occurs within the institution provided by a specialist tutor. There may be specialist mathematics support available as well as assistive technology training.

The amount of funding available differs slightly each year but in 2004 students who had been accepted on a full-time, part-time, postgraduate degree course and certain foundation courses as well as Higher National Diploma courses received the following amounts:

[13] http://www.skill.org.uk/info/infosheets/dsa.doc

- Specialist equipment - maximum £4,460 per course for full and part-time students.
- Non-medical helpers - maximum £11,280 per academic year of the course. For part-time students this allowance will be paid as a percentage of the full-time rate. For instance, if you were studying 50% of the full-time equivalent, the maximum amount you could receive per year would be £5,640.
- Other/general expenditure - maximum £1,490 per academic year of the course. For part-time students this allowance will be paid as a percentage of the full-time rate, as stated above.
- Disability-related travel costs – no maximum limits. There is no travel allowance category in Scotland.

There may also be some specialist equipment on offer from the university possibly on loan but more likely available across a network or in specialist rooms - this will be part of the widening participation agenda and equal access under the DDA part 4.

It was with this lack of knowledge related to the availability of support and types of assistive technologies available that a small survey was undertaken across the university sector in 2004.

Assistive Technology Survey 2004

Methodology
The survey

In all, up to the date of this report, 80 UK Universities and Colleges were contacted by telephone and asked to take part in a short survey. Of these contacted only 23 Institutions or Colleges agreed to complete the survey over the phone. Those who did not take part at the time of contact or returned the telephone call to responded, were e mailed. In all 57 were e mail questionnaires were sent. As of the date of this report **no** emailed questionnaires were returned.

The disability service was contacted via information from the institutions website, and the person who deals with Dyslexic adult learners was asked for. This job title was varied from disability advisor too assistive technology specialist. But overall the person who dealt with Dyslexic learners also knew about the provision or uses of information technology in relation to adult dyslexic learners.

The survey/ questionnaire was made up of 24 questions with 5 separate sections. The sections covered;

1. **Demographics**, i.e. totals student population and what percentage of students were Dyslexic and/or receiving DSA;
2. **Assessment methods and support for Dyslexics without DSA**, i.e. type of testing used and provision for those not receiving DSA (including interim cases).
3. **Provision of equipment**, i.e. technological equipment for loan, software, and stand alone equipment (e.g. scanner with ORC). It also ask where and when this equipment is available.
4. **Exam provision and support**;
5. **Training provision for learners and staff**.

The survey was carried out by one person with the support of a computer with internet access and a telephone with a telephone logging system (supplied number and duration of telephone calls). The survey was carried out between office hours (9-5pm) during the normal working week. Three attempts were made to contact participants, with the first contact being by telephone and if the participant did not return the call then the second attempt was either by email questionnaire or by another telephone call. The 3rd attempt is to follow up the email or second call.

The researcher gave a brief explanation as to the nature of the survey, based on the aims and objectives of the Welsh Dyslexia Project. For example; *"… asking all Higher Education institutions what their current provision and use of information technology they supply for their Adult Dyslexic Learners".* And "*would they be prepared to take part in a short survey of 24 questions …"*

Participants were thanked, if they took part and directed to the Welsh Dyslexic Project website (www.welshdyslexia.info/minerva/project) to find out more information about the project itself.

Results

Demographics

Of the sample surveyed, 23 institutions, there was a total student population of 22328.0, of this figure it can be seen that 53% were disabled, a total of 11854.01. This accounts for just over half the total student population. More interestingly, Dyslexic students account for 41% of the total disabled student population, and 22% of the total student population. However, more concerning, only 41% of those Dyslexic students received Disabled Student Allowance (DSA) , and only 17.08% of disabled students received DSA . Anecdotally, at least half of all institutions surveyed, claimed that this figure may be inaccurate, as confidentiality constrained correct statistics on successful claims. These figures were also confusing as most departments dealt not only with Dyslexic students but also Disabled students, and it was stated that it was difficult to separate Disabled students from Dyslexic

students receiving DSA and 75% of participants only had an integrated figure to give. Therefore two figures arose from the findings, 9.07% of Disabled students and 41% of Dyslexic students, but both are problematic as to their validity of specific need. Three institutions did not have available these types of statistics. *(All these difficulties beg the question as to how was provision assessed against need without correct statistics even of those institutions that had some statistics but weren't sure of their correctness?).*

In addition, Dyslexics with English as a second language only represented 2.5% of the Dyslexic population. However, only 9 institution report an actual figure, the majority did not keep figures on this particular Dyslexic population. This is significant in terms of any EU student would be necessarily accounted for under this figure, so it is not clear how many students are registering with disabled service and therefore being allocated any provision of service. Overall there was a tendency in this section for participants to be vague about figures, saying they were unsure and the timing of the survey may have had an impact due to the beginning of a new academic year and therefore not up to date figures were available.

	Students across 23 institutions	**Disabled students**	**Dyslexic students**	**Students receiving DSA**	**Dyslexics with English as a second language (n=9)**
Total Number	**22328.0**	**11854.01**	**4892.06**	**2025**	**125**
Percentage of total	**100%**	**53%**	**22%**	**9.07%**	**0.55%**
Percentage of disabled students total			**41%**	**17.08%**	
percentage of dyslexic students total				**41%**	**2.5%**

Assessment methods and support for Dyslexics without DSA

Of all those asked , 23 institutions, 9 were administering their own "bespoke" style assessment methods, therefore these style of assessments were used by 39.1% institutions. These methods were anecdotally commented as to be

made up of various different assessments and interview techniques that long standing members of the department had used in practise for many years.

Quickscan, interview only and LAD assessment methods were each used by 17.3% of institutions, whereas Vinegrads' Adult Dyslexic Checklist was used by 8.7% of the institutions.

The finding that the majority of institutions are using their own assessment methods, reflects what is often found in Dyslexia practise. That is that specific scientific and psychologically tested assessment methods are outweighed by tried and tested assessment methods. The debate as to whether this is an effective way to assess Dyslexia remains a hotly debated issue. However, in the majority of participants' responses, 93.5% claimed that they referred potentially dyslexic students on to an educational psychologist.

So why then test at a practitioners level? Maybe there needs to be figures of those students who are not sent for formal testing but are seen at a practitioners level. One participant claimed that all those students she saw for assessment were referred to an Educational Psychologist and had proven Dyslexic tendencies.

Assessment method	**Percentage of use**
Quickscan	**17.3%**
Interview (only)	**17.3%**
Adult Dyslexia Checklist (Vinegrad)	**8.7%**
LAD	**17.3%**
Own Bespoke	**39.1%**

There was a large range of support claimed to be given to students who did not receive DSA. The following covers the majority of those mentioned;

- Handouts or lecture/seminar notes on line
- Extended time on library loans
- tape recording of lecture or seminars for future review by student
- Study support tutors
- Exam provision – including extra time, use of computer and amanuensis
- Academic support – from department/faculty personal tutors or dedicated learning support staff
- Study Skill workshops- available to the whole student population and subjects covering; exam revision and essay and report writing.
- Loaning of equipment, i.e. laptops, digital recorders for recording lectures /seminars.

Of the 23 institutions three mentioned that they had specific funding to support the about provision, with one institutions stating that funding was ring fenced specifically for EU and international students, in need of these provisions.

As it can be seen many of these provisions are akin to those generally supported by funding from the DSA, and or arrange alternative, like loaning of support equipment. These findings imply that departments can mirror DSA funded provision to all those in need, regardless of their funding status. It also, means that departments can offer students an interim provision, whilst the longevity of procedures and formalities involved in assessment and securing of funds, are lived out.

However, are these provisions enough and how many students take up these provisions on a regular basis? Are there statistics about the number of users of loan equipment and other provisions? Are these meeting the needs of these students without DSA? Are the needs of a student without DSA different to those with DSA? If this population includes EU and international students, i.e. those with English as a second language, are there enough specific provision made for translation and other relevant support tools? What Assistive or technological tools are appropriate for this sample of students?

Provision of Equipment

Out of the 23 institutions that participated only 6 had a dedicated assistive technology resource. although this only accounts for 26.08% of those surveyed there were variations in provision, such as a dedicated area within the learning resource centre (library) with clusters of computers providing specialist assistive software. A further issue that arose was that many institutions were not one campus based and therefore had to supply resources over a number of different sites. As it can be seen from the below results, some overcame this problem by networking software across their entire range. The most common software to be networked was concept mapping software (MindGenisus or inspiration) and text to speech and word prediction software (such as Text Help). It appeared that these software companies supplied corporate software licenses, allowing institution to network these items. Only 1 university claimed to provide assistive products on an individual basis, DSA permitting in association with the department the student was attending, i.e. they had no overall provision.

The most unused type of software across the institutions surveyed appears to be software for dictionaries with these only being available networked at 4.3% of institutions. Anecdotally, most said that there were hard copies of reference dictionaries available in their learning resource centres and libraries. Typing tutors also appeared to be common resource and where available appear to

be available to all students not just those who need specific support. This fits with most institutions policies about assignments having to be typed.

Anecdotally most participants claimed that if the relevant software or tool was not available at their institutions, then provision was made for individuals to access through DSA funding or their loan system.

As regards to training for assistive technology, only three participants claimed to have training. Thus, there appears to be a lack of specialist on site help with most participants saying that training is covered by the assistive technology provider for those with DSA only, or that IT helpdesk staff, who are not specifically trained in those packages used, provide assistance. One institution provided assistive technology workshops in the beginning weeks of a new term, thus giving students an initiation to the packages.

Location of provision **Type of provision**	**Assistive technology/study support resource centre**	**Networked across campus**	**Individual Lab computers**
Scanner with OCR	**47.80%**	**30.40%**	**26.08%**
Text to speech	**30.40%**	**26.08%**	**21.70%**
Concept mapping	**26.08%**	**30.40%**	**30.40%**
Word prediction	**21.70%**	**30.40%**	**30.40%**
Specialist spellcheckers	**21.70%**	**17.30%**	**26.08%**
Dictionaries	**13%**	**4.30%**	**8.60%**
Typing tutor	**39.10%**	**39.10%**	**34.70%**

Further issues that arise from these figures is how well are individuals support by communal computers, i.e. are the number of computer proportional to the disabled and dyslexic student population? And are their special needs being meet by simple per head demography. For example that their average time on each computer maybe longer than other students? In addition, anecdotally, quite a few participants said they were looking into the provision of headphones for dyslexic students using communal computers, for concentration reasons. One institution claimed that most students used their own headphones.

Additionally, issues about use versus provision also arise, as whom records provision and use? Is this down to learning resource centres when no specific assistive technology centre is provided and where does funding come from? Although these issues are down to individual institutions are disabled students

sold short due to policies becoming more generic (i.e. networking of specific software).

Exam provision and Support

Out of all the institutions that participated only 1 did not provide any Exam provisions. As it can be seen from the table below 87% of institution were able to provide a scribe and use of a computer in regards to exam provision. Extra time and a separate room were a little lower at 69.5% of institution providing these resources.

Exam provision	Percentage of institutions that provide exam provision
Amanuensis	**87%**
Use of computer	**87%**
Extra time	**69.5%**
Separate room	**69.5%**

Other provisions that institutions reported to provide included;

- Timed breaks;
- Overlays;
- Supervised breaks;
- Take home exams;
- Reader;
- Alternative assessments i.e. viva;
- Rest breaks for certain conditions;
- Hand held spellcheckers;
- Use of voice recognition;
- Flagging of exam papers.

Anecdotally some institutions, said that provision were careful monitored and these were not blanket provision as it was very much based on individual need and careful negotiation with academic staff was involved to ensure fairness.

Training provision for learners and staff

Out of the 23 participating intuitions 2 did not provide Disability or Dyslexia training, thus accounting for 8.65% of those who took part. Therefore, 91.35% of intuitions provided staff training in disability and dyslexia awareness. Some of this training was provided by the disability services themselves or by other

departments and were included in different training, such as equality training. Further examples of provision of training include;

- Disability reps in each faculty
- All staff who are involved with recruiting & selection given disability awareness and mental health awareness training;
- Equal opportunity facilitator in each faculty or department;
- Courses on SENDA;
- Disability named contact
- Covered under Learning to Learn policy
- Covered under equality training
- Staff guide on dyslexia

Disability, widening participation and equal opportunities staff tend to be aware of some of the support strategies in place but most academic staff will have probably only had one short induction course and will only attend to the issues when they are faced with a disabled student in their class. There is still much work to be done to gain the effects needed in anticipation of having a student in a proactive way rather than working in retrospect.

This evidence mirrors the conclusion Tinklin, Riddell and Wilson (2004) came to in their report.

"Current provision for disabled students places too much emphasis on providing them with individual support to get round institutional barriers, rather than on more fundamental institutional change. The intention to 'mainstream' disability remains a rather vague notion at the moment, with no time limits set on achieving any of its component parts."

HESA and UCAS figures for dyslexia

HESA

Year	Total	No Disability	Disabled	Dyslexic	%Disabled	%Dyslexic	%Dys of Dis
1994 95	592,839	577,140	15,699	2,359	2.6%	0.4%	15.0%
1995 96	574,973	557,088	17,885	3,170	3.1%	0.6%	17.7%
1996 97	624,665	602,574	22,091	4,364	3.5%	0.7%	19.8%
1997 98	622,634	598,694	23,940	5,381	3.8%	0.9%	22.5%
1998 99	677,329	650,897	26,432	6,575	3.9%	1.0%	24.9%
1999 00	677,100	650,380	26,720	8,370	3.9%	1.2%	31.3%
2000 01	755,095	724,125	30,970	10,430	4.1%	1.4%	33.7%
2001 02	818,445	780,425	38,020	13,800	4.6%	1.7%	36.3%

UCAS Numbers Accepted

Year	Total	No Disability	Disabled	Dyslexic	%Disabled	%Dyslexic	%Dys of Dis
1999 00	303,065	291,704	11,361	4,964	3.7%	1.6%	43.7%
2000 01	308,718	296,559	12,159	5,681	3.9%	1.8%	46.7%
2001 02	325,472	310,174	15,298	7,570	4.7%	2.3%	49.5%
2002 03	331,725	315,930	15,795	8,153	4.8%	2.5%	51.6%
2003 04	333,942	317,587	16,355	8,866	4.9%	2.7%	54.2%

Note on the Disability Discrimination Act (DDA) Part IV

What is it?
From September 2002 the Disability Discrimination Act was extended to education following amendments introduced by the Special Educational Needs and Disability Act 2001.

The legislation aims to ensure that:
Disabled people have equal opportunities to benefit from, and contribute to, the learning and services available in HE institutions.

Who has responsibilities under the Act?
The Governing Body – referred to by the Act as the responsible body is liable for

the actions of the institution as a whole
the actions of individual employees
the actions of agents

Who is protected by the Act?
Disabled applicants, potential applicants o students who are

full-or part-time
post or undergraduates
home or overseas
on short courses

What facilities are covered by the Act?
All facilities provided wholly or mainly for students including

admissions, enrolment
open days and induction events
careers advice, library services……..
lectures, lab work, field trips
examinations and assessments
graduation services

What is Discrimination?
Discrimination against disabled applicants or students can take place in either of 2 ways

1) treating them less favourably than others
2) failing to make a reasonable adjustment when they are placed at a substantial disadvantage compared to others, for a reason relating solely to their disability.

United States of America

Country: United States of America

Year of entry to EU: N/A
Political system: Constitution-based federal republic
Capital city: Washington D.C.
Total area: 9,158,160 km²
Population: 290 million
Currency: US Dollar
National Language: English
Numbers of students in higher education: TBA

Legislation

What is the definition of:

a) disability

The definition of "disability" varies depending on the purpose for which it is being used. Federal and state agencies generally use a definition that is specific to a particular program or service. For example:

- For purposes of nondiscrimination laws (e.g. the Americans with Disabilities Act, Section 503 of the Rehabilitation Act of 1973 and Section 188 of the Workforce Investment Act), a person with a disability is generally defined as someone who (1) has a physical or mental impairment that substantially limits one or more "major life activities," (2) has a record of such an impairment, or (3) is regarded as having such an impairment.
- To be found disabled for purposes of Social Security disability benefits, individuals must have a severe disability (or combination of disabilities) that has lasted, or is expected to last, at least 12 months or result in death, and which prevents working at a "substantial gainful activity" level.
- State vocational rehabilitation (VR) offices will find a person with a disability to be eligible for VR services if he or she has a physical or mental impairment that constitutes or results in a "substantial impediment" to employment for the applicant.

Some of these definitions include words or phrases that have been the subject of lawsuits, as individuals, agencies, and courts try to clarify the terms used in some of these definitions of disability. If you want to find out if a particular disability or condition gives you certain rights, contact the federal or state agency that enforces the law in question. If you want to find out if you qualify for a particular program or service, contact the federal or state agency that administers the program to find out the specifics of the disability definition they use.
(from http://www.dol.gov/odep/faqs/federal.htm)

b) dyslexia

Dyslexia is commonly considered a sub-category of specific learning disabilities. Other sub-categories include dyscalculia and dysgraphia. There are a variety of non-specific learning disabilities. "Dyslexia" as used in the U.K.

would be considered "Learning Disability" in the U.S. Learning disability is defined:

> The term means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia.
> *Disorders not included*. The term does not include learning problems that are primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.
> (from http://www.dpi.state.wi.us/dpi/dlsea/een/ldcriter.html)

c) is dyslexia a disability?
Learning disabilities are usually considered to be a disability in the U.S.

Guide to the education system with particular respect to university
General guide or link to a web site is acceptable
I don't understand this question

Guide to disability in higher education
Generally speaking, this is handled on a state-wide basis, though institutions that receive federal funding fall under requirements that are defined in the Rehabilitation Act of 1973 sections 504 and 508, as well as the Americans with Disabilities Act (Titles II through V).

What legislation supports dyslexics/disabled students?
see above.

Assessment

Who carries out the diagnostic assessment?
I assume this question is in relation to learning disability. Usually learning disabilities are diagnosed during the K-12 education experience. Post K-12 students who request accommodations for learning disabilities usually need a "recent" assessment, often performed by a public school system (note U.S. difference in definition of public school) evaluator. The evaluator may be an employee or on contract. Depending on the state regulations and resources, as well as institution guidelines, students who desire an assessment may or may not be required to obtain the assessment at their own cost.

What are the qualifications of the assessor?

I don't have sufficient information to answer this at the present time. I suspect it differs based on state and federal requirements. Quite often assessors are trained education professionals or psychologists or psychiatrists.

How do you get an appointment?
In the K-12 system the individual school or school district handles this. In higher education, the student is responsible for locating and scheduling an assessment (often with the help of campus services) or the university may provide the space and funding for assessment.

Who funds assessment?
In the K-12 system, the school, school district or state funds it. The institution may provide postsecondary assessment or it may be the responsibility of the student.

What is assessed and what tests are used?
Cognitive, Attainment
Insufficient background to answer this question.

Personal history
Insufficient background to answer this question.

Where are the diagnostic assessments carried out?
Insufficient background to answer this question.

Who carries out the needs assessment or any other assessment that occurs at a different time to the diagnostic assessment?

Technology
This is often performed in a campus technology center or related unit. The AT department may be housed with a disabled student services office (generally under student services) or within a central computing department.

Exam provision
This is almost always coordinated from within the Disabled Student Services office or equivalent. The DSS office works with the student and instructor to work out the details on exam/test accommodations. This may include additional time, exam proctoring, special technology requests, etc.

Support
Academic support would be provided via a tutoring office or resource on campus if available. At the University of Washington, students would be required to locate and finance any support beyond that provided to all University students.

What are the consequences of the assessment?

Financial support
Students generally to not receive financial support from their institution in the area of disability accommodations. Those students involved in a state department of vocational rehabilitation program may have acquired funding for technology, personal care, or related issues. The institution usually provides services such as notetaking, on-campus transportation, and recording of textbooks and other written course materials. Some institutions may loan special equipment such as FM listening systems, tape players, etc. to students to be used while they are enrolled. Postgraduate students involved in a teaching or research assistant role may have additional support under the laws affecting employees of an institution.

Technology provision
Technology is most often provided in a variety of campus locations and resource centers. Many institutions do not provide equipment considered to be solely for personal use, such as computers and related hardware/software. Generally, if an institution provides equipment to all students, it would provide similar or equitable equipment to a student with a disability. If it does not provide such equipment, it often would not provide that type of equipment to a disabled student. As mentioned above, most institutions do not provide anything considered portable/personal technology unless it is available to all students.

Other
Some universities offer special facilities that have been built up over time and may be known for their expertise/support in specific disability areas. Also, areas of exam accommodations, campus transportation and other accommodations would be a result of assessment.

When does the needs assessment take place?
There is no official needs assessment process such as performed in the U.K. For services provided by a DSS office, needs determination would take place during the initial meetings with that office. There is no requirement that a student with a disability self-identify to the institution, though if they desire services and resources provided for students with disabilities, they usually must go through some sort of intake/orientation process with the relevant campus unit.

How easy is it to access?
"Access" is usually considered to describe physical access to buildings and rooms with respect to people with mobility impairments. It's possible, though unlikely, that a DSS office or AT center would be inaccessible.

Is it widely publicised?
This depends on the institution.

Is there a high general awareness amongst staff?
This depends on the institution.

Technology and support
What software (including hardware for this, as we don't usually differentiate) *is available? Please advise approximate costs in Euros*

3. Text to speech - Cost varies with program features
4. Speech to text - Cost varies with program features
5. Mind mapping - €80
6. Screen enlargement - €500
7. Word prediction with on-screen keyboard €200-300
8. Screen reading - €1200
9. Embossers – Cost varies with hardware features (€3000-10,000)
10. Special keyboards – Cost varies (€50-400)
11. Alternate pointing devices – Cost varies (€50-1100)
12. CCTV systems – (€1100-2200)
13. Scanning OCR Systems (€100-1500)

What other technology is generally available? Eg tape recorders
Not technology, but we try to have adjustable tables and chairs, arm/wrist rests, as well as a variety of other specialized technology such as switch input systems for display and testing purposes.

Are there special places for assistive technology in the university, or is it available everywhere.
Some technology is only available in limited locations, while some software may be provided to all computer systems within an organizational unit.

Can the technology be taken home or is it only available on the university campus?
At the University of Washington, no technology is loaned to individual students.

Other
What level of funding is available to students as grants to help support disability?
Students may use financial aid to fund AT they use for school. This may include federally-backed student loans or grants.

What is the take up level of this funding, and what determines take up levels?
N/a

What training is available for tutors to ensure dyslexia friendly delivery?
"Tutors" in the U.S. provide general or specific assistance with coursework. I'm not sure this is equivalent to UK definition. Regardless, familiarity with

needs of students with LD may or may not be a part of tutor training/orientation. It depends on the institution.

Are there web sites to support them?
There are a variety of web sites to support educators who work with disabled students. The Faculty Room (www.washington.edu/doit/Faculty) is one example.

What percentage of dyslexics are at university? Please provide references
At most institutions, students with LD make up over half of all disabled students.

What are the barriers to dyslexics being at university (eg the need to pass exams in a first or second language, or general lack of support from early on)?
Students with LD face a variety of barriers, not the least of which is finding out about accommodations and developing self-advocacy skills. Much of this should be addressed during the K-12 years but is often neglected or the parents take on the role of advocates. When the students are out of K-12, parents are usually out of the picture. Willingness to learn and use AT for accommodating LD deficits is also a significant barrier, as is providing these accommodations in more locations on campus. Funding personal-use versions of AT is also a barrier, as the more popular solutions (e.g. scanning/OCR systems) are very expensive.

What non-technology support is available?
This is covered above, I believe.

Dyslexia, Higher Education and ICT in Wales

Ian Smythe and Mair Roche

About Wales

The country is 20,760 square miles (8020 square miles), and has a population of around 2.75 million. Cardiff, and ancient sea port in the south, is the capital and seat of the government, the Welsh Assembly.

Wales is part of the United Kingdom of Great Britain and Northern Ireland, and is united politically, legally, and administratively with England. However, the process of devolution has provided greater autonomy. The Welsh Assembly (government) has considerable power to develop and implement policy within many areas including education, training and the Welsh language. According to "*Your Guide to the Assembly"** this means Assembly can make decisions in the areas of:

- developing education, training and lifelong learning in Wales
- administering funding for local authorities in Wales

However, the powers of the Assembly are, particularly with respect to the areas under consideration in this report, at best unclear

Languages

Wales is a bilingual country using the Celtic Welsh as well as English. The Welsh is a Celtic language, with little vocabulary in common with English. For example:

English phrase: "Good morning, my name is Mair Roche"
Welsh equivalent: "Bore da, fy enw i yw Mair Roche"

Around 580,000 people speak Welsh as their first language. 25% of children attending primary schools are learning through the medium of Welsh and it is estimated that 14% of secondary school children do all their learning through the medium of Welsh. The 1993 Welsh Language Act gave considerable impetus to the development of Welsh resources although implementation in many areas is still considerably below that available in English. However, publication of a SEN Code of Practice for Wales, which included the rights to assessment of the child in their preferred language of English or Welsh, was a major step forward in school education. However, it cannot be claimed that the Welsh language is as well resourced in Higher Education. Even if there were the lecturers to provide a wide range of courses in the Welsh language, most course books would still be in English. Of all the students in Higher Education in Wales, less than 1% learns through the medium of Welsh (excluding those learning Welsh language).

Despite education coming under a "lifelong learning" umbrella, the rights to be assessed in one's preferred language of Welsh or English have not as yet been included in the assessment regimes in higher education. The following

questions were put to the Minister of Education and Lifelong Learning and to ELWA in June 2003 in response to the establishment of the DfES Working Party "DSA specific learning difficulties group (dyslexia, dyspraxia, dyscalculia and AD(H)D)" where no Welsh representation was sought.

The main questions were:

> *Is it appropriate that an assessment for dyslexia with respect to provision of Disable Students Allowance is carried out in English for an individual who has Welsh as their first language?*

And

> *What are the implications for higher education institutions in Wales with respect to the Special Educational Needs and Disability Act if the specific context of identification of the special needs of the Welsh learners is not addressed?*

Neither of these have been addressed, although a working party has been set up with respect to "student support arrangements in Wales". Although this areas does not appear to be in the stated remit of the group, the Assembly has suggest they will be addressing this issue.

Screening, Assessments and the Disabled Students Allowance

In the UK, if it can be clearly demonstrated that the dyslexic individual is disabled in the learning environment, they will be entitled to the Disabled Students' Allowance. Responsibility for Disabled Student Allowances (DSAs) and their specific needs, including the assessment process, rests with the Department for Education and Skills (DfES) on an England and Wales basis. It is not currently devolved to the National Assembly for Wales. The Higher Education Act 2004 devolves to the National Assembly responsibility for university tuition fees and student support arrangements in Wales.

The issues concerning the screening and assessment of the dyslexic individual in the English language are the same as those in England and therefore will not be discussed here.

Welsh speakers from Welsh backgrounds are disadvantaged when assessed for the DSA through the medium of English. Difficulties they may have are often put down to the fact that English is their second language!

Given that dyslexia is accepted as a disability in Higher Education, all that should be required is to develop a series of tests in the Welsh medium that could clearly demonstrate dyslexia. If it is acknowledge that "*Dyslexia is a difficulty in the acquisition of literacy skills that is neurological in origin. It is evident when accurate and fluent word reading, spelling and writing develops very incompletely."* then only those items as stated in the definition are required to be developed in the first language. The development of these tests should be a priority if those who enter Higher Education speaking the Welsh

language are not to be discriminated against. Note that this will provide a measure of dyslexia and the disability, but is not a needs assessment. That could be developed separately, though linked to the dyslexia and disability assessment.

The Welsh Dyslexia Project (WDP) developed a Welsh version of the Adult Dyslexia Checklist (Smythe and Everatt, 2001). This is available through the WDP website at www.welshdyslexia.info This checklist has been demonstrated to be of value in several languages. The WDP has also developed a pilot project to investigate the feasibility of remote diagnosis, whereby the student may be assessed using a combination of webcams and specialist computer software. This was designed to understand the issues of how to assess the dyslexic Welsh and English speaking adult when there are so few assessors in Wales. Funding is now being sought to take this forward.

Software

Despite Wales being a bilingual country, there is a distinct shortage of resources to help those who prefer to use the medium of Welsh for studying. Since the availability of English language software is covered elsewhere in this book, this section will concentrate on those resources suitable for students that are available in the Welsh language.

Word Processing

The Welsh version of Microsoft Word is currently under development by Canolfan Bedwyr, Bangor (http://www.bangor.ac.uk/ar/cb/). A collaboration with the University of Manchester hopes to produce a free word processor based on the free word processor developed for the deaf and blind English speaking community. (www.deafblindonline.org.uk)

Grammar checkers and spell checkers

Canolfan Bedwyr has developed on behalf of the BBC a series of online resources which may help the dyslexic student, including a dictionary (including a sound recording of the word), spell checker, mutation checker and guides to grammar.
http://www.bbc.co.uk/wales/learnwelsh/

Demonstration version of the commercially available spelling and grammar checker developed by Canolfan Bedwyr may be downloaded from:
http://www.bangor.ac.uk/ar/cb/cymraeg/demo_meddalwedd.php

Concept mapping

MindFull, developed by Sensory Software (www.sensorysoftware.co.uk) is the only concept mapping tool available in the Welsh language. The Welsh version is available free when the English version is bought. The latest

version includes drawing capability. However, currently there is no spellchecker.

Text to speech
A Welsh computer voice which may be used in a variety of contexts is currently under development by Canolfan Bedwyr. It is hoped that Welsh text to speech software will be one of the outcomes of collaboration between Canolfan Bedwyr and the University of Manchester and may be available from the beginning of 2005.

Speech to text
There are currently no plans by any leading manufacturer to produce a speech-to-text engine in the Welsh language. However, it is known that if the accent of the English in the reference files is close to that of the user, the learning will be quicker, and results more accurate. Therefore if voices can be produced which have a Welsh accent, students will be able to train the software more quickly.

Response to an email to Jane Davidson, Welsh Assembly Minister for Education and Lifelong Learning

Original email - June 2003.
The response below was after a phone call made following an email on 19 September 2004.

Response supplied by From Kevin Clapham on 11 October 2004.
Higher Education Division/Is-adran Addysg Uwch

“The Higher Education Act 2004 devolves to the National Assembly responsibility for university tuition fees and student support arrangements in Wales. The ELL Minister has established an independent review to advise on future Assembly Government policy in these areas. The review is led by Professor Teresa Rees, Pro Vice Chancellor of Cardiff University and is required, among other things, to examine the needs of under-represented groups in higher education including students with disabilities and mature students. Details of the review can be found at the following address: http://www.learning.wales.gov.uk/students/rees-review-e.htm

“Professor Rees is anxious to have views from all interested stakeholders and I am sure would value your comments on the needs of dyslexic adults in higher education, particularly with respect to the Welsh language. “

Appendix 1

Table 1 - All students by HE and FE institution, mode of study, level of study, gender and domicile 2002/03

		Total FE Students				Postgraduates			Undergraduates		
	Total all students	**Total FE students**	Full-time	Part-time	**Total HE students**	**Total PG students**	Full-time	Part-time	**Total UG students**	Full-time	Part-time
Total Wales	**127035**	**7500**	**395**	**7105**	**119535**	**23470**	**9920**	**13555**	**96065**	**60540**	**35525**
University of Wales, Aberystwyth	**12285**	**1460**	0	1460	**10825**	**2395**	895	1500	**8425**	6070	2355
University of Wales, Bangor	**10925**	**1670**	25	1645	**9255**	**1825**	1185	640	**7430**	5430	1995
Cardiff University	**24530**	**1780**	0	1780	**22750**	**5710**	3845	1865	**17040**	13035	4005
University of Wales Institute, Cardiff	**9575**	**485**	145	340	**9090**	**1590**	715	875	**7500**	6080	1420
University of Glamorgan	**19880**	**60**	0	60	**19820**	**3200**	845	2355	**16620**	9380	7240
The University of Wales, Lampeter	**7105**	**0**	0	0	**7105**	**1050**	180	870	**6055**	875	5185
University of Wales College of Medicine	**3750**	**0**	0	0	**3750**	**1330**	225	1105	**2420**	2175	245
University of Wales College, Newport	**9300**	**320**	155	165	**8980**	**1675**	365	1310	**7305**	2535	4770
The North-East Wales Institute of HE	**5960**	**150**	0	150	**5815**	**595**	45	550	**5220**	2590	2630
Royal Welsh College of Music and Drama	**590**	**0**	0	0	**590**	**140**	75	70	**450**	450	0
Swansea Institute of Higher Education	**5645**	**175**	70	100	**5470**	**695**	125	570	**4775**	3300	1475
University of Wales, Swansea	**14705**	**1225**	0	1225	**13480**	**2975**	1275	1700	**10500**	7465	3035
Trinity College, Carmarthen	**2785**	**175**	0	175	**2610**	**285**	150	140	**2325**	1155	1165

Appendix 2 – Further and Higher Education Institutions in Wales

Further Education Institutions

Institution	Locations		
Coleg Sir Gâr	Llanelli	Llandeilo	Ammanford
	Carmarthen		
Coleg Ceredigion	Cardigan	Aberystwyth	
Coleg Gwent	Usk	Pontypool	Cross Keys
	Newport	Ebbw Vale	Abergavenny
Coleg Llandrillo	Rhos-on-Sea	Denbigh	Abergele
Coleg Llysfasi	Ruthin	Wrexham	
Coleg Meirion-Dwyfor	Dolgellau	Pwllheli	Glynllifon
Coleg Menai	Bangor	Llangefni	
Neath Port Talbot College	Neath	Afan	
Pontypridd College	Pontypridd	Rhondda	
Coleg Powys	Newtown	Brecon	Llandrindod Wells
Bridgend College	Bridgend	Pencoed	
Coleg Harlech / WEA (North)	Harlech	Bangor	

Source: Higher Education, Further Education and Training Statistics in Wales: 2001/2002

Universities of Wales

University of Wales, Aberystwyth
University of Wales, Bangor
Cardiff University
University of Wales Institute, Cardiff
University of Glamorgan
The University of Wales, Lampeter
University of Wales College of Medicine
University of Wales College, Newport
The North-East Wales Institute of HE
Royal Welsh College of Music and Drama
Swansea Institute of Higher Education
University of Wales, Swansea
Trinity College, Carmarthen

Appendix 3 - Higher Education student enrolments by disability status, sex and mode of attendance 2001/02

	Sex				Total	
	Male		Female			
Full-time	No.	%	No.	%	No.	%
No known disability	29,279	94	35,688	95	64,967	94
Disability but not in receipt of DSA	667	2	711	2	1,378	2
Disability and in receipt of DSA	858	3	754	2	1,612	2
Disability but information about DSA not known/not sought	429	1	395	1	824	1
No information regarding disability	0	0	0	0		
Total	**31,233**	**100**	**37,548**	**100**	**68,781**	**100**
Part-time						
No known disability	18,867	95	25,390	94	44,257	94
Disability but not in receipt of DSA	642	3	944	4	1,586	3
Disability and in receipt of DSA	109	1	112	0	221	0
Disability but information about DSA not known/not sought	294	1	470	2	764	2
No information regarding disability	4	0	3	0	7	0
Total	**19,916**	**100**	**26,919**	**100**	**46,835**	**100**
All Students						
No known disability	48,146	94	61,078	95	109,224	94
Disability but not in receipt of DSA	1,309	3	1,655	3	2,964	3
Disability and in receipt of DSA	967	2	866	1	1,833	2
Disability but information about DSA not known/not sought	723	1	865	1	1,588	1
No information regarding disability	4	0	3	0	7	0
Total	**51,149**	**100**	**64,467**	**100**	**115,616**	**100**

Source: Higher Education, Further Education and Training Statistics in Wales: 2001/2002

Appendix 4: Further education students at Further Education Institutions

Students by disability status, mode of attendance and sex 2001/02

Full-time / sandwich students

Disability Status	Male	Female	Total
No disability	19,345	21,122	40,467
Disability registered	348	311	659
Disability not registered 681	607	1,288	
Information not yet sought	0	0	0
Total	**20,374**	**22,040**	**42,414**

Part-time / other students

Disability Status	Male	Female	Total
No disability	78,796	114,768	193,572
Disability registered	1,740	1,865	3,606
Disability not registered	1,085	1,288	2,373
Information not yet sought	0	0	0
Total	**81,622**	**117,922**	**199,553**

All students

Disability Status	Male	Female	Total
No disability	98,141	135,890	234,039
Disability registered	2,088	2,176	4,265
Disability not registered	1,766	1,895	3,661
Information not yet sought	0	0	0
Total	**101,996**	**139,962**	**241,967**

Source: Higher Education, Further Education and Training Statistics in Wales: 2001/2002